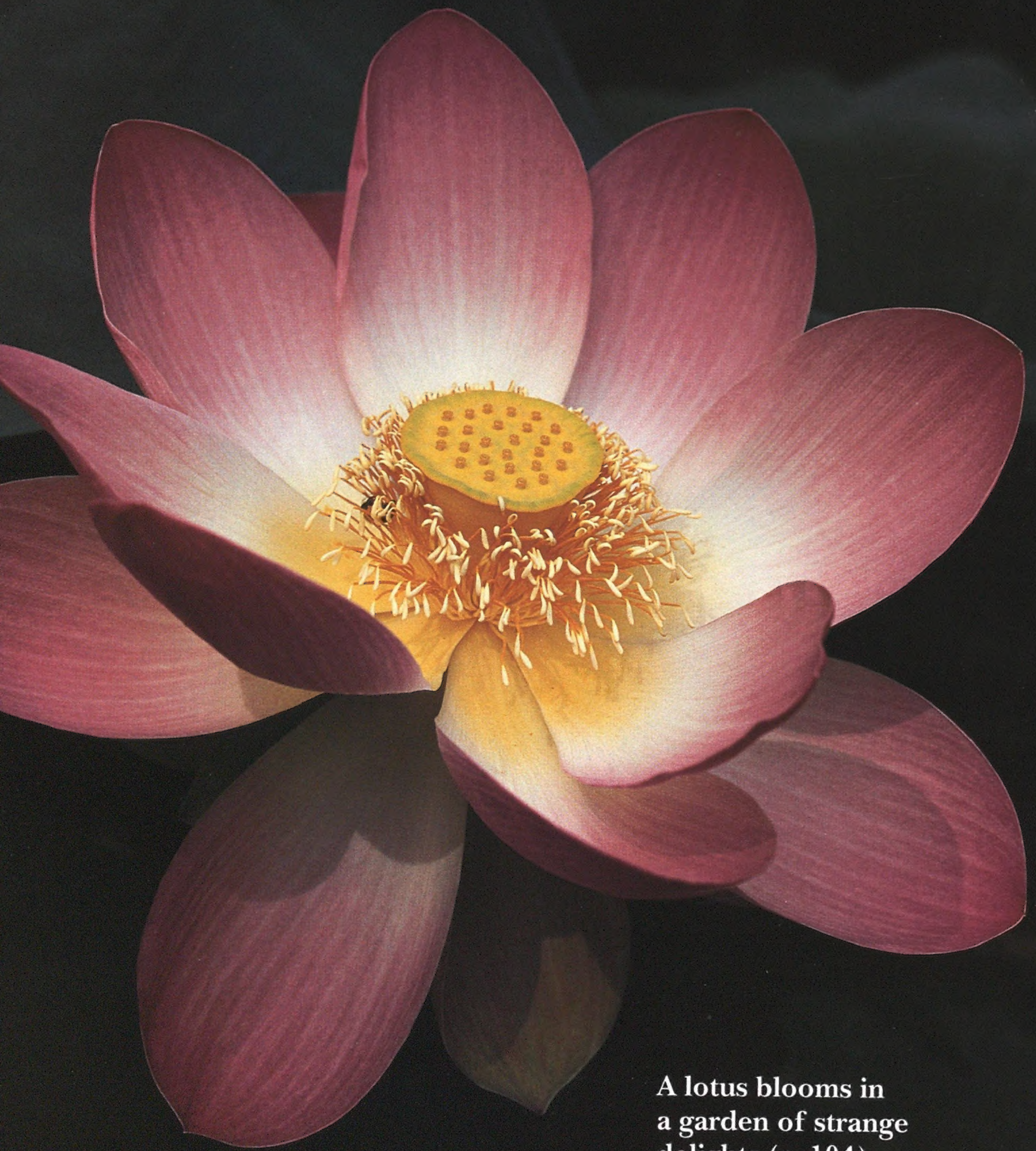
Smithsonian

March 1997



A lotus blooms in a garden of strange delights (p. 104)

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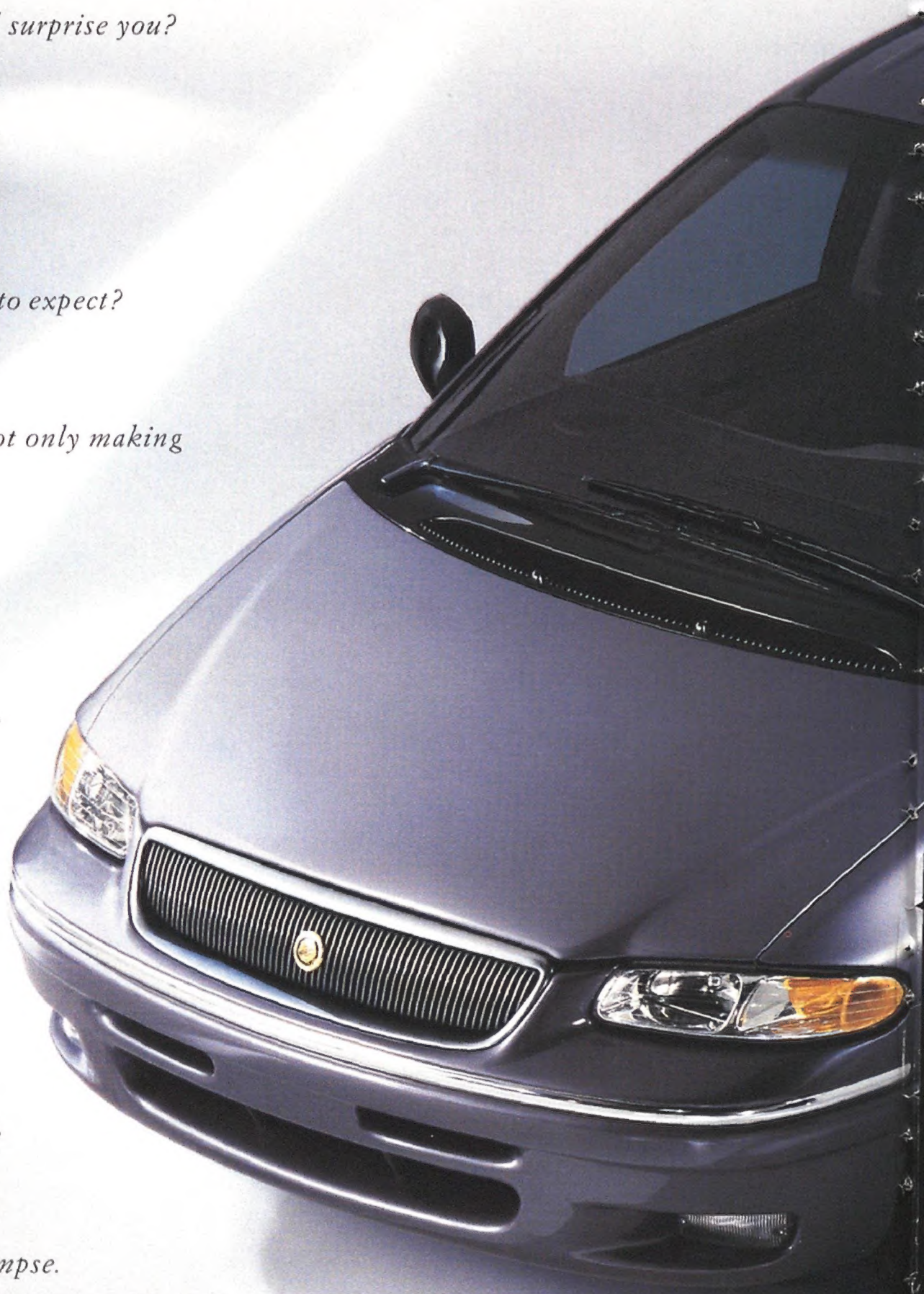

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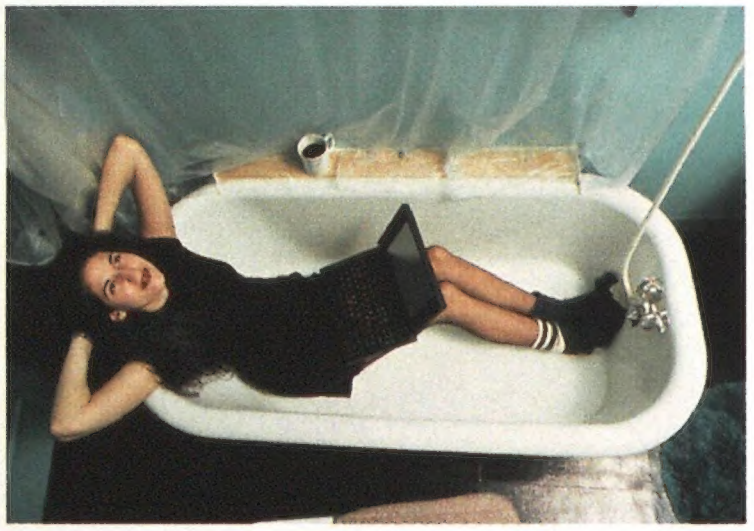

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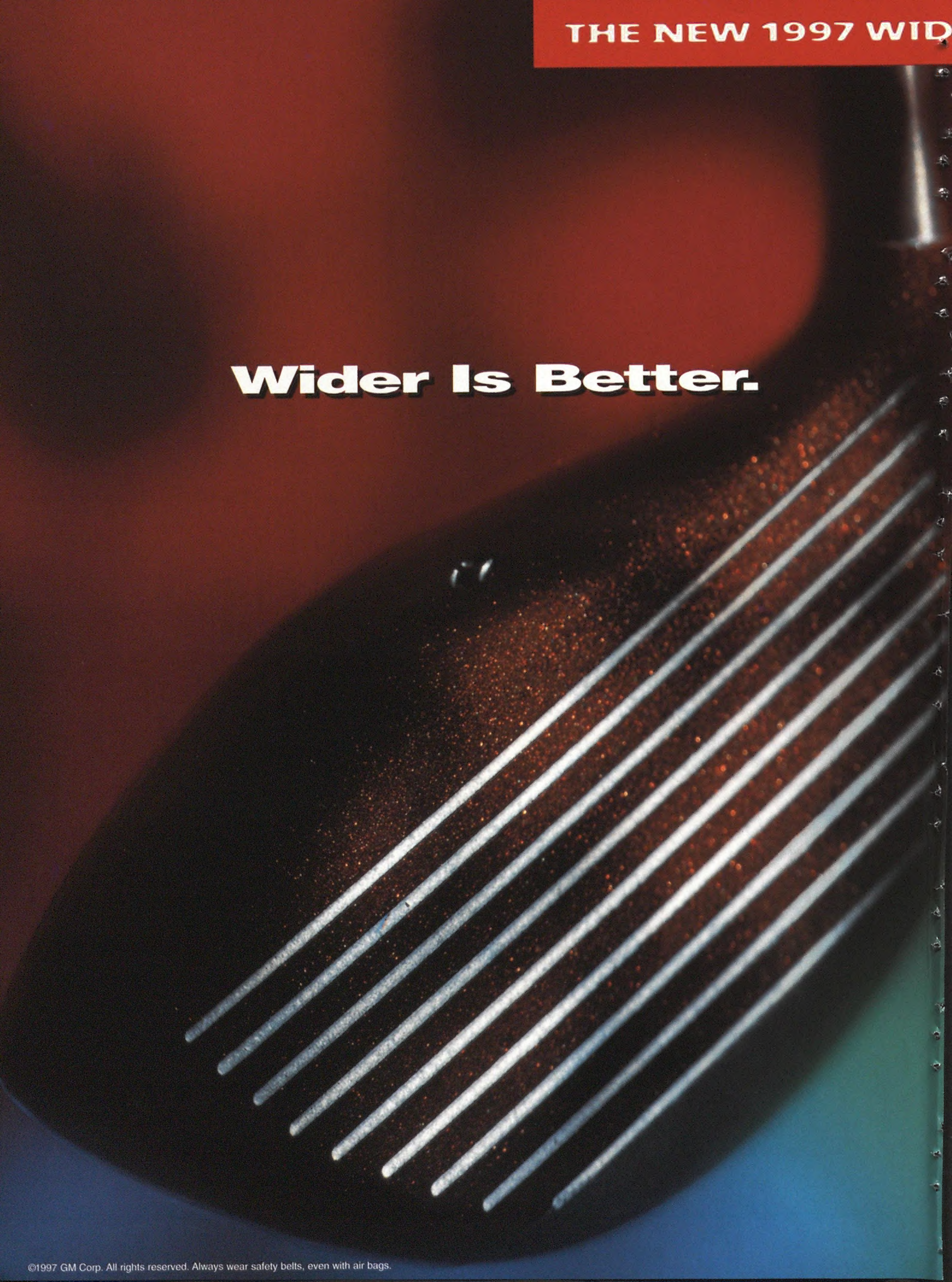

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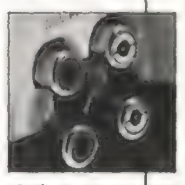

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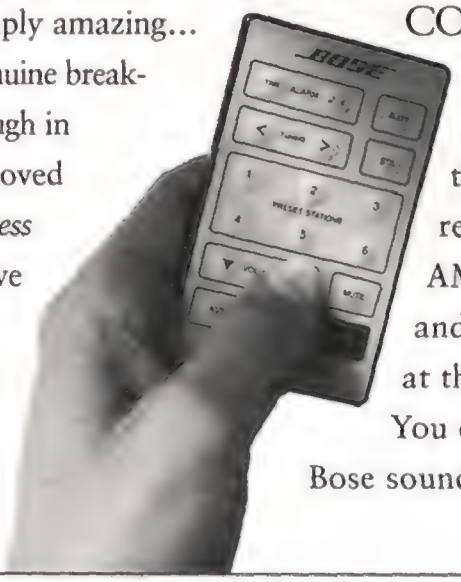

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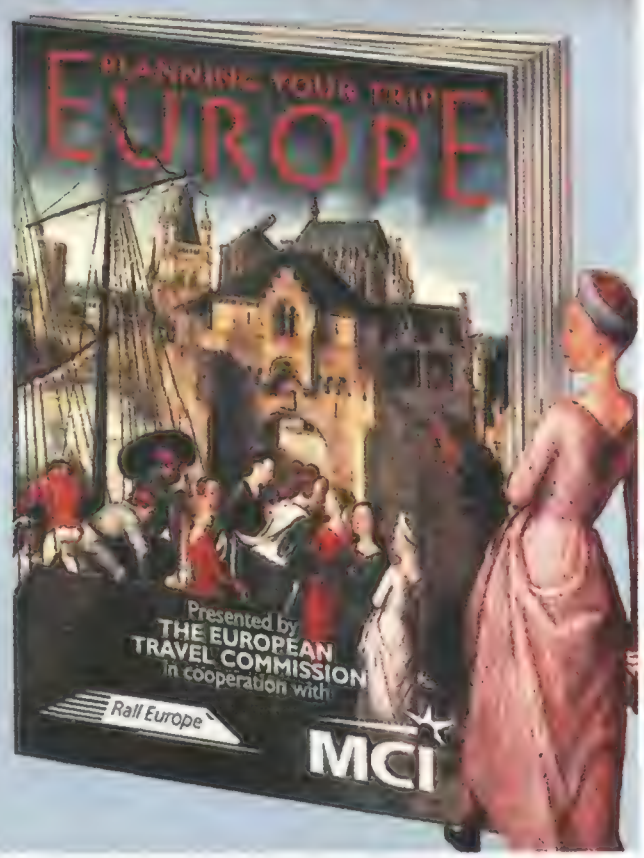

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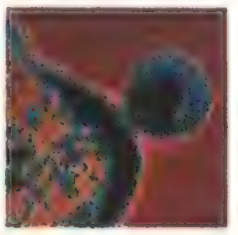
A drug he discovered for transplant patients is now helping millions fight AIDS.

Ken Richardson
pharmaceutical company researcher

"I left high school at age 16 to do odd jobs in a small pharmaceutical lab. Back then I never dreamed that, one day, I would help discover a medicine that would save thousands of lives."

"I loved lab work, so I went back to school at night and worked at the lab during the day. After 12 years, I had my Ph.D. Then I went to work at a pharmaceutical company, where I began research on an anti-fungal medicine to treat deadly infections. For me, a drug saves more than a life. It can save a family."



HIV: The virus that causes AIDS.

"Some of the most deadly infections come from fungi in the air we breathe," says Ken Richardson, a pharmaceutical company researcher. "When you have a healthy immune system, it's not a problem."

Richardson and his research team discovered a lifesaving drug in the early 1980s to treat fungal infections in cancer and transplant patients. When thousands of AIDS patients began turning up with fungal infections, they thought their new medicine might help.

"I'll never forget the first time we tried it in an AIDS patient. She was hallucinating from a fungal infection that was damaging her brain," said Richardson. "The doctor gave her our drug and the next day the hallucinations were gone. Two weeks later she left the hospital." Today, the drug Richardson discovered for his company helps millions of people all over the world.

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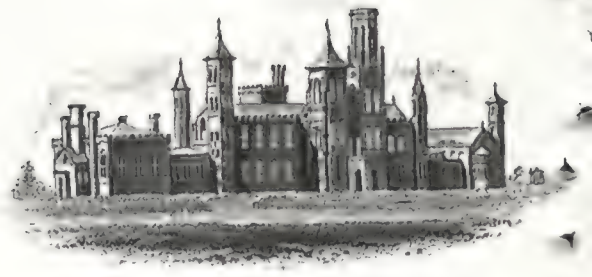


Smithsonian Perspectives

The Smithsonian takes its experts and scholars on the road in its new Voices of Discovery program

The celebration of the 150th anniversary of the Smithsonian continues into the new year, as does our determination to foster an increased sense of "public ownership" of the Institution and to make it more accessible to people around the nation. The centerpiece of these efforts, of course, is the traveling exhibition "America's Smithsonian," which has visited six cities in the past year.

The exhibition is doing an extraordinary job of showcasing nearly 300 of the greatest treasures we hold in trust for the American people. While most people think of the Smithsonian as only a repository of American historical and cultural artifacts, equally important are its human resources—the researchers, scholars, curators and museum educators who give meaning and shape to the Institution's diverse collections. To highlight the many ways in which the Smithsonian contributes to the "increase and diffusion of knowledge," we developed the Smithsonian Voices of Discovery program.

It was Michael Robinson, director of the National Zoological Park, who first recommended that the traveling exhibition be complemented by a selection of Smithsonian scholars. For each city, ten scholars in a variety of specialties would be chosen to give presentations over a five-day period. To implement this concept, we called upon the Smithsonian Associates, the education and membership unit of the Institution, whose staff has many years of experience creating public programs and collaborating with museum directors, curators and research scholars.

Rather than merely holding Smithsonian lectures as part of the traveling exhibition, we wanted the Voices program to reach out more personally to the people by going directly into local communities. To do this, new partnerships were created with local organizations, giving them an opportunity to actively participate in these outreach efforts. I would like to thank the following organizations that contributed funding: the Ahmanson Foundation and the Ralph M. Parsons Foundation in Los Angeles; the Champlin Foundations in Providence, Rhode Island; Pentair, Inc., and the McNeely Foundation in St. Paul/Minneapolis; and, in Houston, the Houston Endowment, Inc., Enron, and Time Warner Cable, Houston division.

With the assistance of a variety of local organizations, Voices programs were held in locations across each of the six host cities and their surrounding areas—in elementary and secondary schools, university auditoriums, public libraries, community centers, retirement homes, and museums and zoos. Audiences were as varied as these program locations suggest—from schoolchildren and university students to museum visitors, volunteer docents, and local scholars and researchers.

Three hundred children packed the Hillcrest Recreation Center in St. Paul, Minnesota, to see Sally Love, exhibit developer at the National Museum of Natural History—and affectionately known as the "bug lady"—demonstrate her live insect friends in a lecture entitled "How to Look at an Insect and Learn about Our World." She also shared her presentation with senior citizens in St. Louis Park, Minnesota.

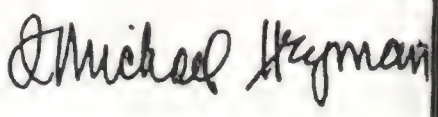
Senior scientist William G. Melson, Division of Petrology and Volcanology at the National Museum of Natural History, captivated family audiences in Providence, Rhode Island, with his presentations on volcanoes and earthquakes. Because of his participation in this Voices program, Melson is now advising the Museum of Natural History in Providence on a new outdoor exhibit about local geologic formations.

While most Voices programs were open to the public, some were developed for specific groups. For the Houston Independent School System, a teachers' in-service day was an opportunity for teachers to attend presentations by a Smithsonian geologist and four museum curators. Alan Fern, director of the National Portrait Gallery, spoke to museum professionals and preservationists at the Historic House Trust of New York City.

I should emphasize the positive and long-lasting impact of these programs. You don't always know specifically whose life is touched or which young scholar-to-be is influenced by the exposure to new ideas and career choices, but you know that it happens. Just ask Steven Newsome, director of the Anacostia Museum, who received a standing ovation at Houston's High School for the Performing and Visual Arts after his presentation on "HIP HOP and History."

As part of Voices of Discovery, 70 Smithsonian scholars, including five museum directors, have shared their expertise and their enthusiasm for learning with approximately 60,000 eager participants at more than 500 separate presentations. The reach of some presentations was extended even further with the use of various telecommunications technologies. Thomas Crouch, chairman of the Aeronautics Department at the National Air and Space Museum, appeared in a one-hour television program about the principles of flight that was later distributed to schools in the Los Angeles area. In Kansas City, Missouri, Andrew Connors, curator at the National Museum of American Art, presented a Voices session on the revival of Hispanic traditional arts that was incorporated into a Hispanic studies telecourse and broadcast live on cable television.

Complementing the "America's Smithsonian" exhibition, the Voices of Discovery program has introduced the Institution to new audiences in a most personal way. It has given us opportunities to demonstrate our commitment to serve Americans wherever they live. We hope the program will continue, beyond the life of the current traveling exhibition, and visit even more communities as we begin our next 150 years.



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And ask your doctor about FOSAMAX—a breakthrough treatment for osteoporosis that's non-hormonal and proven to restore lost bone in many women past menopause. Calcium alone can't do that.

So ask your doctor if FOSAMAX is right for you.

FOSAMAX should be used with caution if you have certain stomach or digestive problems, and should not be used if you have certain disorders of the esophagus (the tube that connects your mouth with your stomach), are unable to stand or sit upright for at least 30 minutes, or have severe kidney disease, low levels of calcium in your blood, or are pregnant or nursing. Like any prescription drug, FOSAMAX may cause side effects, most commonly stomach and muscle, bone or joint pain. Generally, these have been mild and have not stopped people from taking it. However, some patients may develop serious reactions in the esophagus.

But if you're like most women with osteoporosis, FOSAMAX could be an exciting option for you. And a way to rebuild your bone strength.

FOSAMAX. The first non-hormonal treatment for osteoporosis proven to rebuild bone in women past menopause.

FOSAMAX®

(alendronate sodium tablets)

Ask your doctor and call 1-800-910-4217 for more information.

Please see the Patient Information at the end of ad and discuss it with your doctor.

971359(5)(03)-FOS

"When I found out

I had osteoporosis,

I used to hesitate

before I walked

down the stairs."

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FOR OSTEOPOROSIS
PROVEN TO REBUILD BONE.

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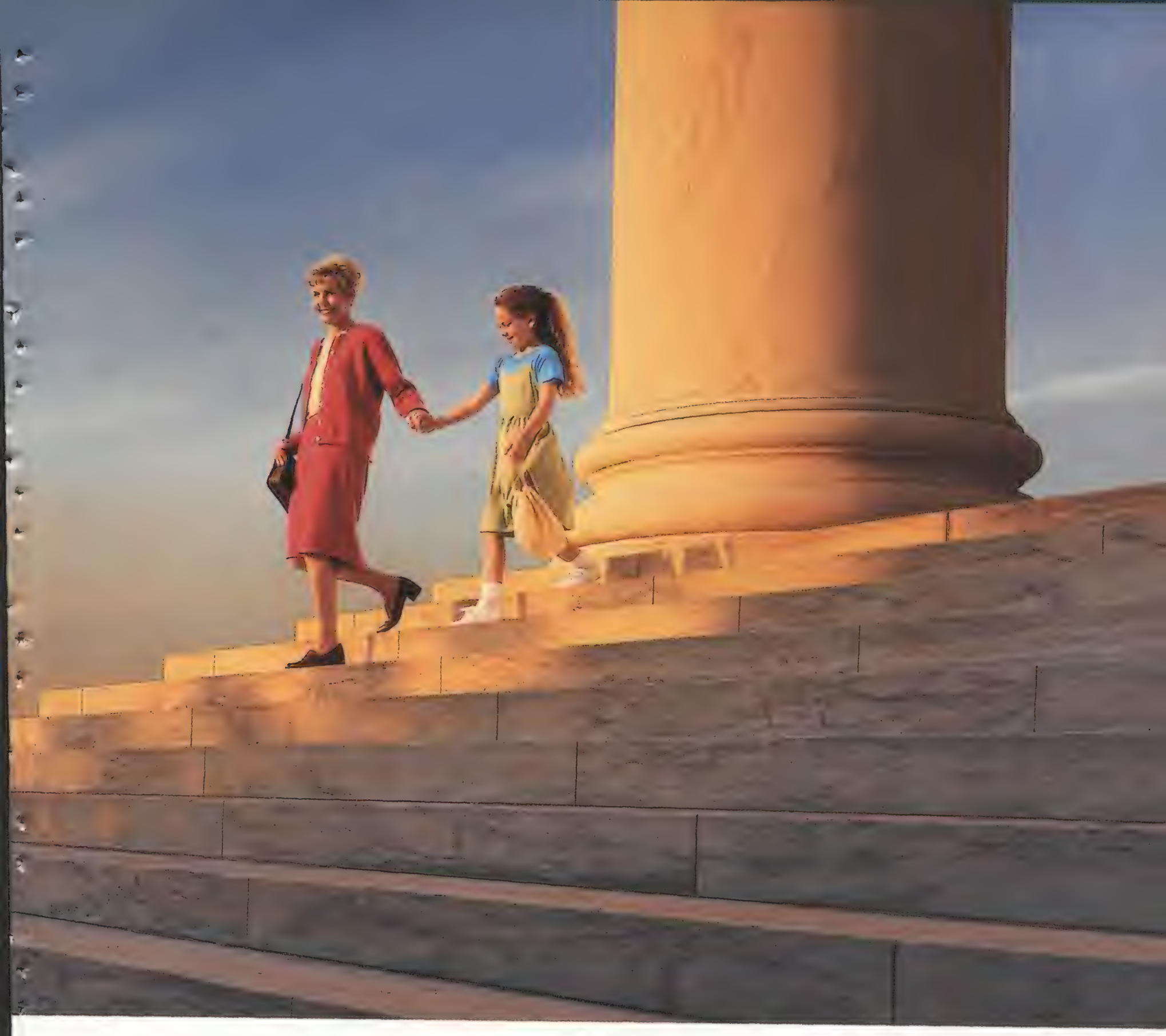

Having osteoporosis doesn't have to mean you'll never be able to do all the things you want to do.

Because there's FOSAMAX—a breakthrough treatment that's non-hormonal and proven to restore lost bone in many women past menopause. And calcium alone can't do that.

Calcium can play a role in maintaining bone health after menopause by slowing bone loss. But contrary to what many people think, calcium can't totally stop bone loss, and can't make your bones any stronger after menopause.

Is FOSAMAX right for you? Ask your doctor. It should be used with caution if you have certain stomach or digestive problems, and should not be used if you have certain disorders of the esophagus (the tube that connects your mouth with your stomach), are unable to stand or sit upright for at least 30 minutes or have severe kidney disease, low levels of calcium in your blood, or are pregnant or nursing.

And like any prescription drug, FOSAMAX may cause side effects, most commonly stomach and muscle/bone pain. Generally, the side effects have been mild and usually have not stopped people from taking it. However, some patients may develop serious reactions in the esophagus.

But if you're like most women with osteoporosis, FOSAMAX could be an exciting option for you. And a way to build back your bone strength. As well as your confidence.

FOSAMAX®

(alendronate sodium tablets)

ASK YOUR DOCTOR OR CALL 1 800 290-4303 EXT. 27

Please see the Patient Information on the next page and discuss it with your doctor.

Letters to the Editor

Chickens

Your picture essay on exotic chickens in the January issue reminded me of an incident in 1973. My husband and I were photographing a children's catalog at the Cincinnati Zoo, which had a prize collection of Polish chickens. Some were really beautiful, some simply odd, but all were exotic, so we chose the birds for one of the background shots.

An avian expert told us that the fanciful birds were the result of hundreds of years of selective breeding by Polish nobles who had an ongoing competition to produce the most unusual or beautiful specimens. Just after the zookeeper stopped speaking, a woman sat down beside me and asked, "What kind of birds are they?"

Proudly displaying my newfound knowledge, I replied, "They're Polish chickens." She stood up, haughtily told me, "I don't appreciate ethnic jokes!" and stomped off.

Thank you for Eric Sander's cover picture of the blue-laced Polish rooster. I hope that woman saw it.

Maureen Marsh
Estes Park, Colorado

FOSAMAX® (alendronate sodium tablets)
Patient Information about
FOSAMAX® (FOSS-ah-max) for Osteoporosis
Generic name: alendronate sodium (a-LEN-dro-nate)

Please read this information before you start taking FOSAMAX. Also, read the Patient Information leaflet each time you renew your prescription, just in case anything has changed. Remember, the leaflet does not take the place of careful discussions with your doctor. You and your doctor should discuss FOSAMAX when you start taking your medication and at regular checkups.

How should I take FOSAMAX?

These are the important things you must do to help make sure you will benefit from FOSAMAX:

1. **After getting up for the day, swallow your FOSAMAX tablet with a full glass (6-8 oz.) of plain water only.**
   Not mineral water
   Not coffee or tea
   Not juice
2. **After swallowing your FOSAMAX tablet do not lie down — stay fully upright (sitting or standing) for at least 30 minutes and until after your first food of the day. Do not chew or suck on a tablet of FOSAMAX.**
3. **Do not take FOSAMAX at bedtime or before getting up for the day.**
   The above actions will help the FOSAMAX tablet reach your stomach quickly and help avoid irritation of your esophagus (the tube that connects your mouth with your stomach).
4. **After swallowing your FOSAMAX tablet, wait at least 30 minutes before taking your first food, beverage, or other medication of the day,** including antacids, calcium supplements and vitamins.
   FOSAMAX is effective only if taken when your stomach is empty.
5. **If you develop difficulty or pain upon swallowing, chest pain, or new or worsening heartburn, stop taking FOSAMAX and call your doctor.**
6. Take FOSAMAX once a day, every day.
7. It is important that you continue taking FOSAMAX for as long as your doctor prescribes it. FOSAMAX can treat your osteoporosis only if you continue to take it.
8. If you miss a dose do not take it later in the day. Continue your usual schedule of 1 tablet once a day the next morning.

What is FOSAMAX?

FOSAMAX is for the treatment of osteoporosis (thinning of bone) in women after menopause. You will find more information about osteoporosis at the end of the leaflet.

How does FOSAMAX work?

FOSAMAX works by:

- Reducing the activity of the cells that cause bone loss
- Decreasing the faster rate of bone loss that occurs after menopause
- Increasing the amount of bone in most patients

These effects are seen as soon as three months after therapy with FOSAMAX has begun. These effects continue as long as you keep taking FOSAMAX. The density of bone increases and the bone is less likely to fracture. Thus, FOSAMAX reverses the progression of osteoporosis.

Who should not take FOSAMAX?

Patients with:

- Certain disorders of the esophagus (the tube that connects your mouth with your stomach)
- Inability to stand or sit upright for at least 30 minutes
- Low levels of calcium in their blood
- Severe kidney disease
- Allergy to FOSAMAX

Patients who are:

- Pregnant or Nursing

FOSAMAX is for use by women after menopause. If you are pregnant or nursing, you should not be taking FOSAMAX. Talk to your doctor.

What other medical problems should I discuss with my doctor?

Talk to your doctor about any:

- Problems with swallowing
- Stomach or digestive problems
- Other medical problems you have or have had in the past

What are the possible side effects of FOSAMAX® (alendronate sodium tablets)?

Like all prescription drugs, FOSAMAX may cause side effects. Side effects usually have been mild. They generally have not caused patients to stop taking FOSAMAX. However, some patients may develop severe digestive reactions including irritation, inflammation or ulceration of the esophagus (the tube that connects your mouth with your stomach). These reactions can cause chest pain, heartburn or difficulty or pain upon swallowing. This may occur especially if patients do not drink a full glass of water with FOSAMAX and/or if they lie down in less than 30 minutes and before their first food of the day. Esophageal reactions may worsen if patients continue to take FOSAMAX after developing symptoms suggesting irritation of the esophagus.

Some patients treated with FOSAMAX experienced abdominal (stomach) pain, which was the most commonly reported side effect. Less frequently reported were other digestive disturbances such as:

Nausea, heartburn, irritation or pain of the esophagus (the tube that connects your mouth with your stomach), vomiting, difficulty swallowing, a full or bloated feeling in the stomach, constipation, diarrhea and gas.

Rarely stomach or other peptic ulcers (some severe) have occurred, but it is not known whether these were caused by treatment with FOSAMAX.

Bone, muscle or joint pain, headache, or an altered sense of taste were also experienced by some patients. Rarely, a rash has occurred. Allergic reactions such as hives or, rarely, swelling of the face, lips, tongue and/or throat which may cause difficulty in breathing or swallowing have also been reported. Mouth ulcers have occurred when the tablet was chewed or dissolved in the mouth.

Anytime you have a medical problem you think may be related to FOSAMAX, talk to your doctor.

What should I know about osteoporosis?

Normally your bones are being rebuilt all the time. First, old bone is removed (resorbed). Then new bone is formed. This balanced process of resorbing and forming bone keeps your skeleton healthy and strong.

Osteoporosis is a thinning and weakening of the bones. It is common in women after menopause. Menopause happens when the ovaries stop producing the female hormone, estrogen, or are removed (which may occur, for example, at the time of a hysterectomy). After menopause, bone is removed faster than it is formed, so bone loss occurs and bones become weaker.

At the start osteoporosis usually has no symptoms, but it can result in fractures (broken bones). Fractures usually cause pain. Fractures of the bones of the spine may not be painful, but over time they cause height loss. Eventually the spine becomes curved and the body becomes bent over. Fractures may happen during normal, everyday activity, such as lifting, or from minor injury that would normally not cause bone to break. Fractures most often occur at the hip, spine, or wrist. This can lead to pain, severe disability, or loss of mobility.

How can osteoporosis in postmenopausal women be treated?

- **Medication.** Your doctor may prescribe FOSAMAX.
- **Lifestyle changes.** In addition to FOSAMAX, your doctor may recommend one or more of the following lifestyle changes:
  - **Stop smoking.** Smoking appears to increase the risk of osteoporosis.
  - **Reduce the use of alcohol.** Too much alcohol appears to increase the risk of osteoporosis and injuries that may cause fractures.
  - **Exercise regularly.** Like muscles, bones need exercise to stay strong and healthy. Exercise must be safe to prevent injuries including fractures. You should consult your doctor before you begin any exercise program.
  - **Eat a balanced diet.** Adequate dietary calcium is important to patients with osteoporosis. Your doctor can advise you whether you need to change your diet or take any dietary supplements such as calcium or vitamin D.

This medication is prescribed for a particular condition. Do not use it for another condition or give the drug to others. Keep FOSAMAX and all medicines out of the reach of children. If you suspect that more than the prescribed dose of this medicine has been taken, drink a full glass of milk and contact your local poison control center or emergency room immediately. Do not induce vomiting. Do not lie down.

The Patient Information leaflet provides a summary of information about FOSAMAX. If you have any questions or concerns about either FOSAMAX or osteoporosis, talk to your doctor. In addition, talk to your pharmacist or other health care provider.

MERCK & CO., INC. Issued November 1996 West Point, PA 19486, USA

FOSAMAX
(alendronate sodium tablets)

MERCK

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My family raised two beautiful breeds of chickens, Wyandots and Jersey Giants, in addition to Rhode Island Reds and Plymouth Rocks. The Wyandots were fairly large birds with white feathers tipped with silver around the neck. One of our roosters delighted in perching on a shoulder as we walked around.

The Jersey Giants were not at all peaceful, and you had to be very wary of them, as they would peck holes in the tops of your shoes.

James R. Bird
Medford, New Jersey

There are several hundred varieties of purebred chickens that would no longer exist without the attention of the hobbyist. Granted, rare and unusual chickens have very little economic value, but the pleasure they bring to those who raise them is tremendous. In today's busy world, perhaps we would all be better off if more of us had a rewarding, down-to-earth hobby.

Murray McMurray
McMurray Hatchery
Webster City, Iowa

Just think of the new fly patterns that anglers could tie using those fantastic feathers. To me, chickens are good for two things: flies and table fare.

Robert J. Grove
Tucson, Arizona

Chateau Sarzay

Robert Wernick's excellent article about Richard Hurbain and his family was inspiring. On my next visit to France, I must visit the Hurbains' restored feudal castle, Sarzay. An Englishman's home may be his castle, but a Frenchman's castle is his home.

Eric Beveridge
Brooklyn, New York

O. Henry

Having read with pleasure and admiration Bruce Watson's article on O. Henry, I feel obliged, as the other defender of William Sydney Porter, to congratulate him both as a reader and as an ally. I edited for Penguin Books a *Selected Stories* in 1993, as well as a *Cabbages and Kings*, and I amalgamated my prefaces to those two into an essay in my just-published *Hunter Gracchus*. I contend that *Cabbages and Kings* is a very modern kind of novel, or at least a unified narrative, much like Eudora Welty's *The Golden Apples* and Sherwood Anderson's *Winesburg, Ohio*.

I've read O. Henry all my life (I'm 69), but it was not until Penguin asked me to do their volumes that I read all the stories. I kept going back to the masterpieces, "The Duplicity of Hargraves" and "A Municipal Report," and ten or so others that I could trust to be what reading ought to be. My opinion of him was raised even higher. (H. L. Mencken's put-down cannot hide what he learned from O. Henry.) I omitted "The Gift of the Magi" from my Penguin selection as it seems to me dumb of a reading public to allow a writer as fertile and inventive as O. Henry to have *one* story.

My theory is that the pseudonym is hidden in "*Oh*io State P*en*itentiary."

Guy Davenport
Lexington, Kentucky

Although William Sydney Porter was federal prisoner No. 30664, he did not spend time in a federal prison. At the time he was convicted of embezzlement, the federal government had few of its own prisons. Attorneys general, therefore, arranged for federal prisoners to be boarded in various state prisons. After Porter was sentenced in Austin, Texas, he was sent to the Ohio State Penitentiary in Columbus.

Paul W. Keve
Richmond, Virginia

In "The Gift of the Magi," Jim did not sell his pocket watch to purchase a brush for his wife, as Bruce Watson wrote. Jim bought Della "a set of combs, side and back, that Della had worshipped for long in a Broadway window. Beautiful combs, pure tortoise shell with jewelled rims—just the shade to wear in the beautiful vanished hair."

Alice C. Ewing
Jackson, Mississippi

In 1907, O. Henry married his second wife, Sara Lindsay Coleman, who was a member of a very old western North Carolina family and lived near Asheville. In 1909, on one of his few visits here, the author rented an office in downtown Asheville where he reportedly wrote "Let Me Feel Your Pulse," a satiric look at the "rest cure" in the area.

The late William Pinckney Herbert was O. Henry's Asheville doctor and wrote his impressions of his famous patient: "I can recall his appearance vividly. I can almost hear his low, rather deep

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voice talking of the many ailments from which he suffered. He was frank as to his habits. 'I know I smoke too much, keep late hours, and drink too much, but that's about all.'"

O. Henry is buried in Asheville's Riverside Cemetery, a few hundred yards from Asheville native and novelist Thomas Wolfe.

John A. Bridges
Asheville, North Carolina

Toothpicks

Sue Hubbell's article was surprisingly timely. For Christmas this past year a friend gave me a present that she said "you won't get from anyone else"—a walrus-whisker toothpick.

Ramona Wickencamp
North Platte, Nebraska

Toothpicks play an essential role in modern molecular genetics. After being sterilized in an autoclave, common flat wooden toothpicks make an ideal and economical tool for transferring bacterial colonies between petri dishes to screen for various characteristics. Every graduate student working in the field of bacterial genetics has gone through several lifetimes' supply of these picks during the lengthy course of dissertation research.

Jeff Driscoll, PhD
Slinglerlands, New York

Your article on toothpicks states that the prophet Muhammad used a toothpick dipped in "the holy-water fountain at Mecca" that was carried by a servant called the "master of the toothpick." An illustration shows a "humorous" rendition of this supposed servant.

It is reported that a companion—certainly not a servant—of the Prophet carried his "miswak," which was a cutting from a particular tree used to clean the teeth and massage the gums. It is true that the prophet Muhammad is known for his emphasis on oral hygiene. Even today, many Muslims enjoy the health benefits of the miswak.

The well of Zamzam in Mecca may be the "holy-water fountain" to which you referred. The water there, however, is not holy.

Ibrahim Hooper
Council on American-Islamic Relations
Washington, D.C.

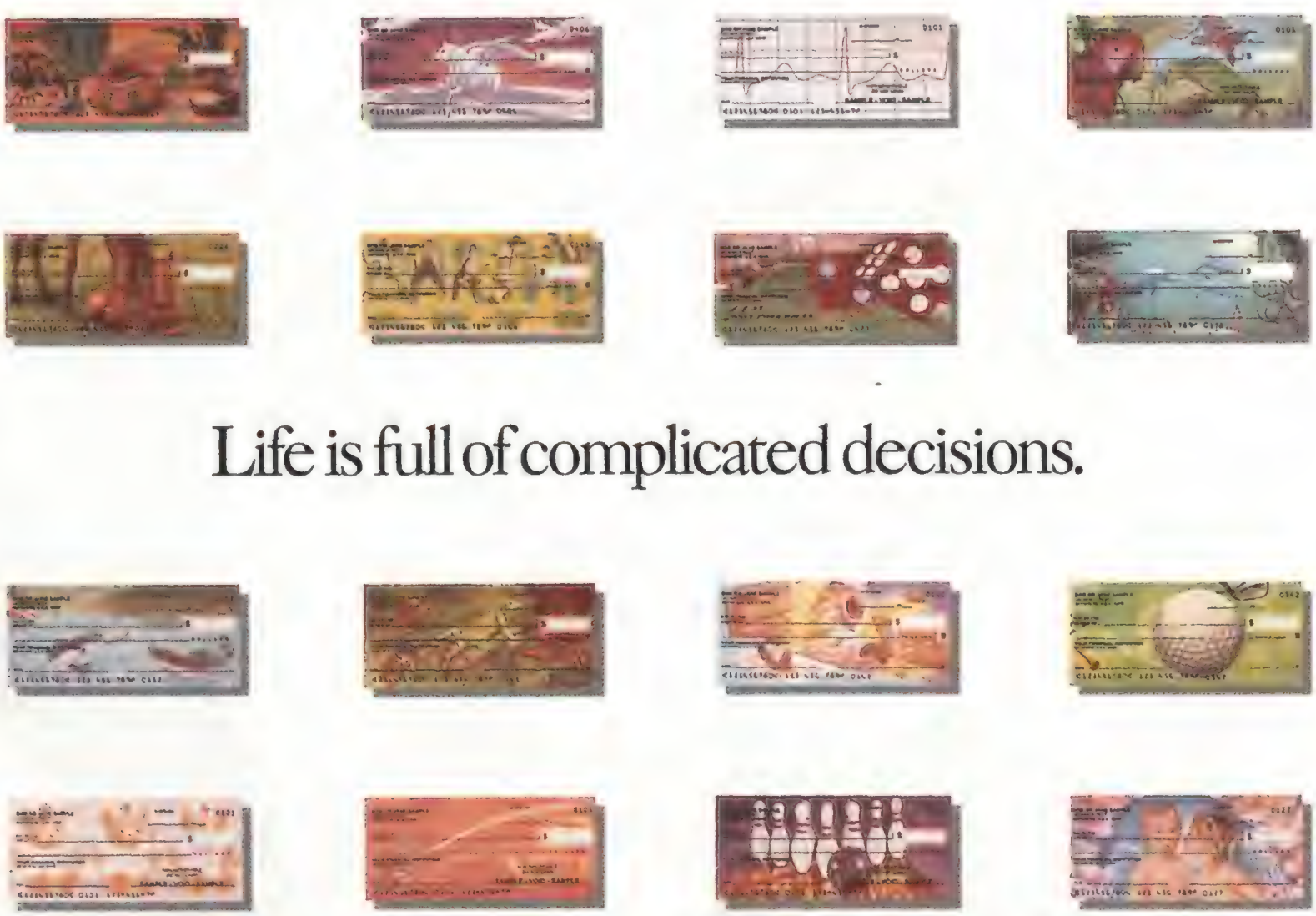
Obelisks

Using trigonometry and engineering statistics, it is easy to show that the laborers on pages 22 and 23 of Evan Hadingham's excellent article needed to pull about 65,000 pounds to right the 40-ton obelisk. Each member of a 200-person workforce would have to pull 325 pounds. Since no person can pull more than 100 pounds without sliding, *Nova* needed 650 laborers. A 340-ton obelisk would require 6,000 laborers. The ancient Egyptians knew that engineering problems required engineering solutions. Did the experiment fail because the *Nova* team did not include an engineer, physicist or mathematician?

Wayne A. Charlie, PhD
Professor of Civil Engineering
Colorado State University
Fort Collins, Colorado

Nova *producer Michael Barnes believes they failed because the pitch of the ramp to the pedestal stone was too shallow. A civil engineer would have helped, but what they needed most was more time.* Ed.

I would like to clarify that Pope Alexander VII commissioned Gian Lorenzo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Bernini to design St. Peter's Square as we know it today, 70 years after Sixtus V commanded Domenico Fontana to move the obelisk to its present site in 1586. In many respects, the location of the obelisk influenced Bernini's design.

John Pinto
Department of Art and Archaeology
Princeton University
Princeton, New Jersey

Sir Francis Drake

I hope author Simon Winchester can put me in touch with the financiers of the group that "recently came forward with plans" to find Francis Drake's 400-year-old coffin in the ocean near Panama. I would be pleased to propose other ventures. One of my favorites involves the colony of New York. It seems they have an interesting bridge that could be purchased . . .

Richard B. Blankfield
Spencerport, New York

Perspectives (October 1996)

We recognize and support the Smithsonian Institution's long-term ecological research program that Secretary I. Michael Heyman described in his October 1996 *Perspectives* column.

The U.S. Department of Agriculture Forest Service has studied and continuously monitored several experimental watersheds for hydrology, climate, nutrient runoff and other ecosystem attributes. Some examples are Coweeta Hydrolic Laboratory in North Carolina, Hubbard Brook in New Hampshire and H. J. Andrews Forest in Oregon.

Federal agencies can and do conduct long-term ecological studies as part of their mandate to care for our nation's public lands. In part, close teamwork with universities and support from other government agencies, such as the National Science Foundation under its successful Long Term Ecological Research program, have enabled the Forest Service to accomplish its goals. We welcome increased collaboration with the Smithsonian in its research efforts.

Jerry A Sesco
Deputy Chief of Research
USDA Forest Service
Judy L. Meyer
Research Professor of Ecology
University of Georgia, Athens

Send mail to edletters@aol.com or post it to Letters Editor, SMITHSONIAN *magazine, 900 Jefferson Drive, SW, MRC 406, Washington, DC 20560. Letters may be edited for clarity and length.*

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Around the Mall and Beyond

By Michael Kernan

An all-day Saturday seminar on spices—one of the many programs on the Mall, around the world, even in cyberspace, offered by the Smithsonian Associates

Hugging the seed of the nutmeg fruit is a crimson aril called mace. Its flavor is sublime—together with ginger, mace is just right for a chilled carrot soup.

Went to a seminar on spices and got a shock before I'd hardly sat down. That thing about spices being used to preserve meat, or cover the stink when it gets rotten? It's a myth.

You could hear the gasp in the hall when Elisabeth Rozin, a food historian, told us why this is nonsense. Yes, sometimes French sauces are accused of trying to compensate for stale meat. But no combination of spices will mask the awful smell of rotten meat or keep you from getting violently sick. If you really need to preserve meat, what you want is salt—not technically considered a spice since it's a mineral—or vinegar.

Rozin has made a study of the alleged curative powers of chicken soup (I say, how does one get to become a food historian and can an English major apply?) and declares this to be in part a matter of mythology as well.

First of all, how do you define chicken soup? "Different cultures," said Rozin, "have different constellations of spices that they use to put their own labels on certain common foods."

To illustrate the point, she issued little paper nut cups containing six samples of chicken broth. They were indeed a revelation. The Chinese style featured ginger and sesame; southern Italian had olive oil, garlic, tomato and oregano, and tasted like pizza; Thai had coconut and lime, coriander, lemongrass and hot pepper; Egyptian mixed cumin, lemon, garlic and mint tastes; Indian had ginger and coriander; and the Mexican version smacked of chilies, oregano and cumin.

With all this competition, why do people think that the version made by American Jewish mothers is as good as penicillin? "In the old country, chicken was often the only meat that Jews got, and then not every day; for many it was served only on religious occasions. When people came to America in the early 20th century, chicken was a lot more available," Rozin observed. The immigrants apparently needed to keep chicken special, so a secular mythology arose about chicken soup being curative. Rozin gives American Jewish immigrants the credit for popularizing the belief in the curative benefits of chicken soup but questions whether the chicken part has any unique value.

"Throughout history, and in many cultures, people have known about the benefits of various hot liquids. In the 19th century, many Americans thought the best remedy for minor maladies was hot beef tea." Chicken soup might be especially good as a decongestant, but hot lemonade or any vitamin-rich soup, in particular one spiced with pepper, garlic, onions and curry powder, will provide most of the same benefits.

Our next speaker, Julie Sahni, explained to us that most spice plants tend to grow in hot climates—primarily within 15 degrees above or below the Equator—and tend to be naturally low in moisture, so that even when picked, they retain fragrance and volume. Herbs, however, grow in temperate climates and tend to be the leaves and stems of plants that do not have hard bark and that do not lose their moisture quickly.

"Spices make things digestible, too," she said, "and they're extremely good for you." In fact, the ancients knew to combine certain spices with various foods to make them go down and stay down, so to speak. Cumin deters the flatulence caused by chickpeas; epazote—also known as wormseed or goosefoot—makes refried beans act less like beans.

"Our industrialized society is so far removed from the basic knowledge of

our grandfathers that we use recipes without understanding why they work," observed Sahni, an architect, food writer and director of a cooking school and a spice company in Brooklyn. "You have to know when not to overspice and be careful with certain combinations; for example, bay leaf, cloves and basil. Together they usually taste awful."

Using slides taken on her cuisine tours of Asia, she showed us how spices are grown and harvested. It all has to be done by hand, which is why spices are expensive. The seeds, leaves, stems, buds, whatever, are picked with care lest they be crushed and prematurely begin to lose their potency.

The pepper vine kills the tree it grows on, which of course complicates everything. The fruit of the nutmeg tree—known in Indonesia as a hallucinogen and aphrodisiac, which will not surprise the eggnog crowd—has to be pulled off one by one.

And each individual clove can be harvested only on one night in a season, when the bud is exposed. If your cloves lack that central bud—the little hump in the middle of the spikes—you know they aren't the best.

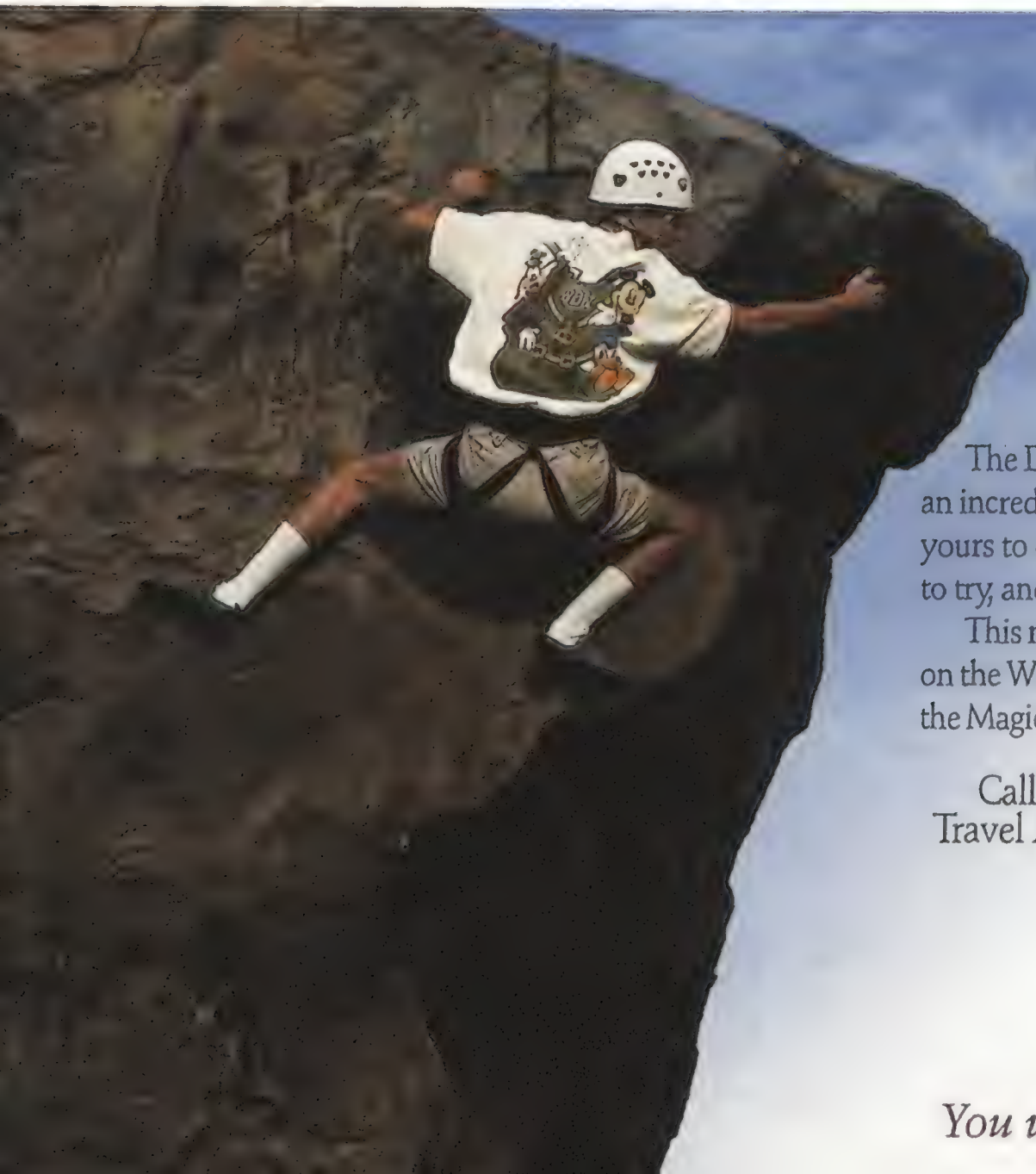
Vanilla, the lovely bean that Montezuma offered to Cortés, has to be pollinated in a single day of the season, a job that requires the small hands of women and children.

Cinnamon comes from the bark of a tree that grows so slowly that, in Sri Lanka, for example, it doesn't rate valuable field space but is grown in straggling rows on street shoulders.

There were some 170 of us at this all-day seminar on spices, one of the many programs offered by the Smithsonian Associates, the Institution's membership and continuing education arm. On the Mall here in Washington, across the country, around the world and even in cyberspace, the Associates present more than 2,000 courses, lectures and performing arts events a year! I know you're still thinking about spices and food, but I'd like to digress just a bit more to give you some examples of Associates programs. In 1996, Associates shared recipes with Julia Child, heard tales of the deep from Jacques Cousteau, enjoyed seeing Kenneth Branagh and Sir Derek Jacobi at a Washington premiere of the new film version of *Hamlet*, and learned about the beginnings of broadcast journalism with Walter Cronkite. This year Ken Burns will do a behind-the-scenes presentation on his latest work, *Thomas Jefferson*; the Muppets will give an up close look at the genius of Jim Henson; and sportswriter Shirley Povitch will talk about Jackie Robinson and Branch Rickey.

The Associates also conduct the nation's largest museum-based educational travel program, each year offering more than 360 Smithsonian Study Tours and Seminars all over the world (see page 103).

My own favorite part of the spices seminar was the lunch, which included a Burmese green bean salad and a chilled carrot soup with ginger and mace. Mace is the crimson, vinelike substance that covers the nutmeg seed. It is peeled from the seed, dried and ground into powder. Many people think the flavor is just about the same as nutmeg, but I'm told that gourmets appreciate



Clinging to the jagged rock,
Nick was comforted by
the knowledge that all he
had scheduled for tomorrow
was cooking class.

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You won't believe what you can do

the unique subtlety of mace. It certainly did wonders for the carrots (for the recipe, visit the SMITHSONIAN Website, http://www.smithsonianmag.si.edu).

After lunch, we were all in a perfect mood to hear our third speaker, Ann Wilder—owner of Vanns Spices in Baltimore, a company that specializes in premium-quality spices—talk about pepper. Tellicherry black pepper, for example, is picked when red, and it takes one person a day to strip one vine of pepper. The berries are laid out to dry on the ground, where people and animals walk right over them.

"You don't want to look at a peppercorn through a microscope if it's not sterilized," Wilder said, and then had to reassure the safety-preoccupied audience that the ones we get are carefully cleaned. We heard a lot about pepper. I suspect that most spice lectures get to pepper sooner or later, because it and other hot spices have a way of making themselves remembered.

I have my own story. When we were living in London some years ago, I shopped at a neighborhood Cypriot grocery run by three jolly brothers. One day I noticed a display of mustards and chutneys, and I asked them which was the mildest. Oh, they said, exchanging a three-way glance, the lemon chutney by all means. Very light, very delicate. It looked light. Yellowish-white, with bits of rind. Rather like a fine marmalade.

It was not until I had spread some of that chutney on my roast beef and run for the kitchen and held my mouth under the cold-water faucet for several minutes that I noticed the inside of the jar top. That appalling mixture of spices, I was convinced at the time, had destroyed the threads of the screw-on cap and all but eaten clean through the metal top itself. Oh how they laughed when I reported back. I've since learned that alcohol or fat is the best antidote for tongue burners.

Wilder gave us some pepper samples: Tellicherry black (a bit sweet, most agreed), Malabar black (less sweet), Brazilian (just plain hot) and Sarawak white (mild but hard to find outside Britain), and these were only a handful of the world's great peppers. They all tasted pretty much the same to me. "Pepper is incredibly short-lived,"

After being picked by hand, *Piper nigrum* (black pepper) berries are laid on the ground to dry, then cleaned—we hope—and packaged as peppercorns.

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Wilder noted. "As soon as you grind it, the flavor begins to go off."

Paprika is a mild red pepper that differs dramatically in different soils. Hungarian is nothing like Spanish, which is fermented and more fragrant. "Just a touch is all you need," added Sahni.

Some varieties of chilies, the hot fruits of capsicum plants, can be diluted a million to one in water and still be tasted. A person can be addicted to them, Sahni told us, and require ever larger doses for the kick.

So many things to remember: black pepper does not dissolve very well in water, Sahni explained, but does dissolve in alcohol (in a wine sauce, for instance), and then it quadruples in power. It shouldn't be cooked anyway, she opined, but sprinkled as a garnish. "Pepper can easily react during cooking and turn a sauce bitter."

All the speakers emphasized that we should buy spices in the smallest amounts possible and should use them fresh. We were even advised to buy little grinders for our kitchens and make the powders as needed.

When you buy your whole spices in small quantities, for the most part keep them at room temperature, though coriander and paprika can be refrigerated. And keep them away from light and heat. Red pepper, paprika, turmeric and ginger are OK in powder form; they retain their flavor quite well.

On to salt. "There are many kinds of salt," said Wilder, "though most people use plain table salt. Mines are flooded; the salt dissolves in the water, which is then pumped out and boiled off. When you do that you lose the minerals, the calcium and so forth, and that's not good."

She showed us a football-size chunk of salt, streaky with minerals. A product called Realsalt is mined with pick and shovel, and so retains the minerals. Kosher salt is kosher because it has no additives. Some say sea salt tastes "saltier" than the others.

"I use kosher because I can get my hand in the box and control it better when dispensing it," she said. "I hate table salt. It's bitter."

We all tasted our samples and agreed. The bitterness may come from aluminum salts, iodine and other additives, including sugar in some brands. Wilder also passed out samples of other salts: Japanese (tasted of seaweed) and Korean (baked in bamboo and good for headaches, say the Koreans).

I can remember when the average kitchen had nothing much besides cinnamon, cloves and maybe allspice, but with the influence of ethnic cuisines we have discovered all kinds of spices and herbs. Now the question is whether our indiscriminate combinations of them will violate the delicious traditions of the different cultures.

"The extended family which passed that heritage along is largely gone now," Rozin said. She collects what she considers to be examples of horrendous "fusion" cuisine. "I once had something called 'Siamese Tacos.' For me, the combination of the strong corn flavor from the tortilla and the Thai spices used for the pork filling was awful. On the other hand, back when the conquistadors brought tomatoes back to the Mediterranean from Mexico, maybe tomato sauce was so novel and radical it was considered bad fusion cooking."

My mind was still on lunch. Nobody needed the saltshaker.

The Object at Hand

By Edwards Park

A bejeweled box from a sorely beset emperor leads to a Yankee dentist, and how he rescued the beautiful empress Eugénie from a Paris mob

Stickpin. The word conjures up Diamond Jim Brady and other big spenders of the Gilded Age. A jeweled pin that held a gentleman's scarf or ascot in place and at the same time allowed him to show off a bit. Or how about a tiny golden box, like the one above with "N" for Napoleon encrusted in diamonds on its cover.

Many such objects reside at the Cooper-Hewitt, National Design Museum, the Smithsonian's unique New York branch housed in the grand old Carnegie Mansion. The Cooper-Hewitt's rich collections are sometimes displayed in groups that have a unifying theme.

It was at just such a show that viewers might have paused before the golden box, part of a bequest to the Cooper-Hewitt from the Thomas W. Evans Collection in Philadelphia. And who was this Evans, this wealthy connoisseur, benefactor and amasser of valuables? He was a friendly neighborhood dentist.

Of course, the neighborhood happened to be the very best section of Paris at the time of the elegant Second Empire (1852-70). And Dr. Thomas Evans' clientele included France's imperial family, most notably Napoleon III and Empress Eugénie. A most successful American abroad, Evans made his fortune by being charming and dependable, as well as skillful with angled mirror, pick and drill.

In 1847, after only four years in practice, Evans, from a good old Quaker family, won an award for his gold fillings at Philadelphia's Franklin Institute. That brought him a bid to join the famous Dr. Cyrus Starr Brewster, who was caring for some very high-class teeth in—of all places—Paris.

Off went young Tom Evans and his wife, Agnes. He soon was packing his examining rooms with the haut monde. Louis-Napoleon, nephew of the "Little Corporal" and a fine-looking man with a well-twirled lady-killer mustache, was his most illustrious client; his teeth were as sensitive as his ambition was prodigious. The gentle care of "Handsome Tom" Evans delighted this eminent patient, and when he pulled off a coup d'état and in 1852 declared himself Napoleon III, Emperor of France, he appointed the American in Paris "Surgeon-Dentist" to the imperial court.

The new emperor took a shine to a Spanish noblewoman, Eugénie Montijo, and Evans was an honored guest when they were wed. His acceptance by

At 41, sporting whiskers and a clutch of medals, Thomas Evans had become the favorite dentist of Parisian high society.

the imperial couple inspired other members of European royalty to seek his services—not solely as a dentist. Evans, known for his tact as well as his skill, often got, along with an eyeful of monarchical decay, an earful of regal intrigue. The dentist became a useful pipeline for rulers who wished to keep in touch without formal summit meetings. President Lincoln's Secretary of State, William H. Seward, learned from his consul general in Paris that "when the crowned-heads of Europe wish to communicate with one another without any responsibility they send for Dr. Evans to fix their teeth."

Evans saw the Franco-Prussian War coming, and on July 4, 1870, the dentist threw a huge party for Americans at his palatial home and warned them that war was imminent. It broke out two weeks later. Though France had a famous army ready to fight—according to one of its marshals, "down to the last gaiter button"—Prussia had Chancellor Otto von Bismarck, a general named Helmuth von Moltke, and trains to bring up men and supplies. Six weeks after Napoleon III declared war, his country was invaded and whipped. On September 2, he surrendered himself and 100,000 troops at Sedan. Two days later the news reached Paris, and the Second Empire collapsed. A mob proceeded to tear down all symbols of the empire and headed for the Tuileries palace, where the empress was still in residence.

Late that afternoon of September 4, Thomas Evans returned home after checking on the American-style field hospital that he had set up in the city. He found two ladies waiting for him. A distraught Empress of France, heavily veiled and accompanied by Madame

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Ambitious Napoleon III and his imperious wife, Eugénie, came to grief when he imprudently declared war on Prussia in 1870, lost and was taken prisoner, leaving the lady at the mercy of a revolting citizenry.

Lebreton, her loyal lady-in-waiting, sought the American's help. The Paris mob had stormed the palace gates, shrieking for the blood of "the Spanish woman." She had escaped by the skin of her well-tended teeth.

Dear Dr. Evans, her old friend, was possibly her last chance to get away from France, to reach England where her 14-year-old son, "Lou-Lou," was already safely ensconced. Evans recruited his associate, Dr. Edward Crane, and quickly made plans to get Eugénie to Deauville in Normandy, in hopes of finding a vessel to take her across the Channel to England.

The dentist had a pass the British Embassy had once made out for the use of a British doctor and his patient. He dug it out, informed the empress that she was now the patient and explained that he would pose as her brother. Dr. Crane would be her doctor and Madame Lebreton her nurse.

In Evans' enclosed landau the party set out the next morning. At the city gates, a guard appeared at the left-hand carriage door to take a look inside. Foreseeing this, Evans had placed Eugénie in the left rear corner, well back from the window and safe from any perfunctory glance. He then effectively blocked the window by leaning out to answer the guard's questions.

Gerald Carson, in his *The Dentist and the Empress,* tells a fine, old-fashioned adventure story of their 100-mile journey. Evans' trip with the empress through a countryside swinging violently toward revolution sometimes seems to spring straight from *The Scarlet Pimpernel.* Carson describes the dentist bluffing and bribing officials and coping with the foibles of a not entirely sensible grande dame cooped up in mortal danger and vast discomfort. Once, seeing a policeman picking on a townsman, Eugénie rose from her carriage seat, loudly declared herself to be the empress and ordered the cop to stop. The villagers stared at her. But Evans quickly gestured that she was insane—tapping the side of his head with a forefinger—and they turned away with a laugh and a shrug.

In Deauville, he and Dr. Crane hunted for secret transport to England. They found a 60-foot cutter named *Gazelle,* and quietly introduced themselves to the owner, Sir John Burgoyne, probably a remote relation of "Gentleman Johnny" Burgoyne, the British general who surrendered at Saratoga in 1777. This Sir John was dubious about smuggling the empress across the Channel, but his wife was for it. At dawn *Gazelle* slipped out of the harbor with the two French ladies hidden below, bound on a storm-tossed voyage to safety.

Back in France, the war turned into the siege of Paris, with *le rat sauce madère* on many a menu and, briefly and bloodily, government in the revolutionary hands of the Paris Commune. A peace treaty, devastating to France, was signed in May 1871. Then the ex-emperor was able to join his wife and son in England where he sickened and died following an operation for bladder stones.

Carrying the last hopes of a Bonapartist restoration, the young prince got a British military education and wangled his way into the Zulu War, raging in South Africa in 1879. Prince Louis-Napoleon was deemed "too plucky and go ahead." But young British officers liked him and chuckled when he claimed he'd prefer to be killed by an assegai than a bullet because "it would show we were at close quarters."

Lou-Lou got his wish. Off on a scouting detail, he and his escort were ambushed by 40 Zulus. The prince's horse broke away as he was trying to mount up. He was dragged 100 yards but turned toward his attackers, revolver blazing. Pierced 18 times by spears, his body was so mangled that Dr. Evans had to identify it by checking the boy's dental work.

Heartbroken Eugénie felt her life had ended, but she lived on and on, a tragic widow and bereaved mother, surviving World War I. She died, barely remembered, in 1920 at age 94.

Her dashing dentist became a Paris fixture. He acquired a mistress, the beautiful Méry Laurent, an actress and artist's model, often for the Impressionist Edouard Manet. She was fetchingly endowed and faithful after her fashion. Leaving Evans would be a wicked thing, she declared, so she must content herself with deceiving him.

Handsome Tom apparently knew of the deceits. Both he and Agnes Evans simply accepted their situations as part of the good life. Warmed by Méry's companionship, Evans befriended artists and began collecting paintings as well as jewelry.

Evans did not charge important clients for fillings. Instead, he grew rich by using their inside information to buy and sell real estate in the fashionable heart of Paris. The gifts that he accepted—he couldn't say no—added up to a treasure trove. By the end of his life he was worth more than $4 million.

Agnes Evans died in 1897. Tom brought her home to Philadelphia for burial at Woodlands Cemetery and died soon after. His will established a combined dental school and museum in Philadelphia, affiliated with the University of Pennsylvania. This School of Dental Medicine sent a bequest from the Evans Collection to the Cooper-Hewitt in 1983. It consisted of rings, pins, earrings, bracelets, and boxes, often gold, with enamel or jewel adornment.

Tom Evans once noted a conversation he had had with his imperial patient: "This stone," said the emperor, indicating a diamond, "I had taken from the hilt of a sword belonging to my uncle, Napoleon the First."

And that stone adorned a new gift to Evans: a stickpin. One of those at the Cooper-Hewitt? Quite possibly.

Ms. Godsey's Art Students Have Learned A Lot About Mixing Colors.

Naturally, Anne Godsey wants her art students to explore the relationships between space, color, texture and form. But to her, what's even more important is that they explore the relationships between people.

To make a statement about race relations, Ms. Godsey's class created "Together As One," a life-sized sculpture calling for unity among all the students of San Leandro High School, regardless of their interests or the color of their skin. The project left its participants with a sense of mutual respect. And the sculpture itself earned a permanent home within the school.

For proving that artwork can help promote teamwork, State Farm is pleased to present the Good Neighbor Award to Anne Godsey, along with $5,000 to San Leandro Schools of San Leandro, California.

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CONTRAINDICATIONS: Hypersensitivity to any component of this medication. Active liver disease or unexplained, persistent elevations in liver function tests (see **WARNINGS**). *Pregnancy and lactation. Atherosclerosis is a chronic process and discontinuation of lipid-lowering drugs during pregnancy should* have little impact on the outcome of long-term therapy of primary hypercholesterolemia. Cholesterol and other products of cholesterol biosynthesis are essential components for fetal development (including synthesis of steroids and cell membranes). Since HMG-CoA reductase inhibitors decrease cholesterol synthesis and possibly the synthesis of other biologically active substances derived from cholesterol, they may cause fetal harm when administered to pregnant women. Therefore, HMG-CoA reductase inhibitors are contraindicated during pregnancy and in nursing mothers. **Pravastatin should be administered to women of childbearing age only when such patients are highly unlikely to conceive and have been informed of the potential hazards.** If the patient becomes pregnant while taking this class of drug, therapy should be discontinued and the patient apprised of the potential hazard to the fetus. **WARNINGS: Liver Enzymes —** HMG-CoA reductase inhibitors, like some other lipid-lowering therapies, have been associated with biochemical abnormalities of liver function. Increases of serum transaminase (ALT, AST) values to more than 3 times the upper limit of normal occurring on 2 or more (not necessarily sequential) occasions have been reported in 1.3% of patients treated with pravastatin in the US over an average period of 18 months. These abnormalities were not associated with cholestasis and did not appear to be related to treatment duration. In those patients in whom these abnormalities were believed to be related to pravastatin and who were discontinued from therapy, the transaminase levels usually fell slowly to pretreatment levels. These biochemical findings are usually asymptomatic although worldwide experience indicates that anorexia, weakness, and/or abdominal pain may also be present in rare patients. **It is recommended that liver function tests be performed before the initiation of treatment, at 6 and 12 weeks after initiation of therapy or elevation in dose, and periodically thereafter (e.g., semiannually).** Patients who develop increased transaminase levels should be monitored with a second liver function evaluation to confirm the finding and be followed thereafter with frequent liver function tests until the abnormality(ies) return to normal. Should an increase in AST or ALT of three times the upper limit of normal or greater persist, withdrawal of pravastatin therapy is recommended. Active liver disease or unexplained transaminase elevations are contraindications to the use of pravastatin (see **CONTRAINDICATIONS**). Caution should be exercised when *pravastatin is administered to patients with a history of liver disease or heavy alcohol ingestion* (see **CLINICAL PHARMACOLOGY: Pharmacokinetics/Metabolism**). Such patients should be closely monitored, started at the lower end of the recommended dosing range, and titrated to the desired therapeutic effect. ***Skeletal Muscle — Rare cases of rhabdomyolysis with acute renal failure secondary to myoglobinuria have been reported with pravastatin and other drugs in this class.*** Uncomplicated myalgia has also been reported in pravastatin-treated patients (see **ADVERSE REACTIONS**). Myopathy, *defined as muscle aching or muscle weakness in conjunction with increases in creatine phosphokinase (CPK)* values to greater than 10 times the upper normal limit, was rare (< 0.1%) in pravastatin clinical trials. Myopathy should be considered in any patient with diffuse myalgias, muscle tenderness or weakness, and/or marked elevation of CPK. Patients should be advised to report promptly unexplained muscle pain, tenderness or weakness, particularly if accompanied by malaise or fever. **Pravastatin therapy should be discontinued if markedly elevated CPK levels occur or myopathy is diagnosed or suspected. Pravastatin therapy should also be temporarily withheld in any patient experiencing an acute or serious condition predisposing to the development of renal failure secondary to rhabdomyolysis, e.g., sepsis; hypotension; major surgery; trauma; severe metabolic, endocrine, or electrolyte disorders; or uncontrolled epilepsy.** The risk of myopathy during treatment with another HMG-CoA reductase inhibitor is increased with concurrent therapy with either erythromycin, cyclosporine, niacin, or fibrates. However, neither myopathy nor significant increases in CPK levels have been observed in three reports involving a total of 100 post-transplant patients (24 renal and 76 cardiac) treated for up to two years concurrently with pravastatin 10-40 mg and cyclosporine. Some of these patients also received other concomitant immunosuppressive therapies. In one single-dose study, pravastatin levels were found to be increased in cardiac transplant patients receiving cyclosporine. Further, in clinical trials involving small numbers of patients who were treated concurrently with pravastatin and niacin, there were no reports of myopathy. Also, myopathy was not reported in a trial of combination pravastatin (40 mg/day) and gemfibrozil (1200 mg/day), although 4 of 75 patients on the combination showed marked CPK elevations versus one of 73 patients receiving placebo. There was a trend toward more frequent CPK elevations and patient withdrawals due to musculoskeletal symptoms in the group receiving combined treatment as compared with the groups receiving placebo, gemfibrozil, or pravastatin monotherapy (see **PRECAUTIONS: Drug Interactions**). **The use of fibrates alone may occasionally be associated with myopathy. The combined use of pravastatin and fibrates should be avoided unless the benefit of further alterations in lipid levels is likely to outweigh the increased risk of this drug combination. PRECAUTIONS: General —** Pravastatin may elevate creatinine phosphokinase and transaminase levels (see **ADVERSE REACTIONS**). This should be considered in the differential diagnosis of chest pain in a patient on therapy with pravastatin. *Homozygous Familial Hypercholesterolemia.* Pravastatin has not been evaluated in patients with rare homozygous familial hypercholesterolemia. In this group of patients, it has been reported that HMG-CoA reductase inhibitors are less effective because the *patients lack functional LDL receptors. Renal Insufficiency.* A single 20 mg oral dose of pravastatin was administered to 24 patients with varying degrees of renal impairment (as determined by creatinine clearance). No effect was observed on the pharmacokinetics of pravastatin or its 3α-hydroxy isomeric metabolite (SQ 31,906). A small increase was seen in mean AUC values and half-life ($t_{1/2}$) for the inactive enzymatic ring hydroxylation metabolite (SQ 31,945). Given this small sample size, the dosage administered, and the degree of individual variability, patients with renal impairment who are receiving pravastatin should be closely monitored. **Information for Patients —** Patients should be advised to report promptly unexplained muscle pain, tenderness or weakness, particularly if accompanied by malaise or fever. **Drug Interactions —** *Immunosuppressive Drugs, Gemfibrozil, Niacin (Nicotinic Acid), Erythromycin:* See **WARNINGS: Skeletal Muscle**. *Antipyrine:* Since concomitant administration of pravastatin had no effect on the clearance of antipyrine, interactions with other drugs metabolized via the same hepatic cytochrome isozymes are not expected. *Cholestyramine/Colestipol:* Concomitant administration resulted in an approximately 40 to 50% decrease in the mean AUC of pravastatin. However, when pravastatin was administered 1 hour before or 4 hours after cholestyramine or 1 hour before colestipol and a standard meal, there was no clinically significant decrease in bioavailability or therapeutic effect. (See **DOSAGE AND ADMINISTRATION: Concomitant Therapy**.) *Warfarin:* In a study involving 10 healthy male subjects given pravastatin and warfarin concomitantly for 6 days, bioavailability parameters at steady state for pravastatin (parent compound) were not altered. Pravastatin did not alter the plasma protein-binding of warfarin. Concomitant dosing did increase the AUC and Cmax of warfarin but did not produce any changes in its anticoagulant action (i.e., no increase was seen in mean prothrombin time after 6 days of concomitant therapy). However, bleeding and extreme prolongation of prothrombin time has been reported with another drug in this class. Patients receiving warfarin-type anticoagulants should have their prothrombin times closely monitored when pravastatin is initiated or the dosage of pravastatin is changed. *Cimetidine:* The $AUC_{0\text{-}12\ hr}$ for pravastatin when given with cimetidine was not significantly different from the AUC for pravastatin when given alone. A significant difference was observed between the AUC's for pravastatin when given with cimetidine compared to when administered with antacid. *Digoxin:* In a crossover trial involving 18 healthy male subjects given pravastatin and digoxin concurrently for 9 days, the bioavailability parameters of digoxin were not affected. The AUC of pravastatin tended to increase, but the overall bioavailability of pravastatin plus its metabolites SQ 31,906 and SQ 31,945 was not altered. *Cyclosporine:* Some investigators have measured *cyclosporine levels in patients on pravastatin, and to date, these results indicate no clinically meaningful* elevations in cyclosporine levels. In one single-dose study, pravastatin levels were found to be increased in cardiac transplant patients receiving cyclosporine. *Gemfibrozil:* In a crossover study in 20 healthy male *volunteers given concomitant single doses of pravastatin and gemfibrozil, there was a significant decrease* in urinary excretion and protein binding of pravastatin. In addition, there was a significant increase in AUC, Cmax, and Tmax for the pravastatin metabolite SQ 31,906. Combination therapy with pravastatin and *gemfibrozil is generally not recommended. In interaction studies with aspirin, antacids* (1 hour prior to PRAVACHOL), *cimetidine, nicotinic acid,* or *probucol,* no statistically significant differences in bioavailability were seen when PRAVACHOL (pravastatin sodium) was administered. *Other Drugs:* During clinical trials, no noticeable drug interactions were reported when PRAVACHOL was added to: diuretics, antihypertensives, digitalis, ACE inhibitors, calcium channel blockers, beta-blockers, or nitroglycerin. **Endocrine Function —** HMG-CoA reductase inhibitors interfere with cholesterol synthesis and lower circulating cholesterol levels and, as such, might theoretically blunt adrenal or gonadal steroid hormone production. Results of clinical trials with pravastatin in males and post-menopausal females were inconsistent with regard to possible effects of the drug on basal steroid hormone levels. In a study of 21 males, the mean testosterone response to human chorionic gonadotropin was significantly reduced ($p < 0.004$) after 16 weeks of treatment with 40 mg of pravastatin. However, the percentage of patients showing a ≥ 50% rise in plasma testosterone after human chorionic gonadotropin stimulation did not change significantly after therapy in these patients. The effects of HMG-CoA reductase inhibitors on spermatogenesis and fertility have not been studied in adequate numbers of patients. The effects, if any, of pravastatin on the pituitary-gonadal axis in pre-menopausal females are unknown. Patients treated with pravastatin who display clinical evidence of endocrine dysfunction should be evaluated appropriately. Caution should also be exercised if an HMG-CoA reductase inhibitor or other agent used to lower cholesterol levels is administered to patients also receiving other drugs (e.g., ketoconazole, spironolactone, cimetidine) that may diminish the levels or activity of steroid hormones. **CNS Toxicity —** CNS vascular lesions, characterized by perivascular hemorrhage and edema and mononuclear cell infiltration of perivascular spaces, were seen in dogs treated with pravastatin at a dose of 25 mg/kg/day, a dose that produced a plasma drug level about 50 times higher than the mean drug level in humans taking 40 mg/day. Similar CNS vascular lesions have been observed with several other drugs in this class. A chemically similar drug in this class produced optic nerve degeneration (Wallerian degeneration of retinogeniculate fibers) in clinically normal dogs in a dose-dependent fashion starting at 60 mg/kg/day, a dose that produced mean plasma drug levels about 30 times higher than the mean drug level in humans taking the highest recommended dose (as measured by total enzyme inhibitory activity). This same drug also *produced vestibulocochlear Wallerian-like degeneration and retinal ganglion cell chromatolysis in dogs* treated for 14 weeks at 180 mg/kg/day, a dose which resulted in a mean plasma drug level similar to that seen with the 60 mg/kg/day dose. **Carcinogenesis, Mutagenesis, Impairment of Fertility —** In a 2-year study in rats fed pravastatin at doses of 10, 30, or 100 mg/kg body weight, there was an increased incidence of hepatocellular carcinomas in males at the highest dose ($p < 0.01$). Although rats were given up to 125 *times the human dose (HD) on a mg/kg body weight basis, serum drug levels were only 6 to 10 times higher* than those measured in humans given 40 mg pravastatin as measured by AUC. The oral administration of 10, 30, or 100 mg/kg (producing plasma drug levels approximately 0.5 to 5.0 times the human drug levels at 40 *mg) of pravastatin to mice for 22 months resulted in a statistically significant increase in the incidence of* malignant lymphomas in treated females when all treatment groups were pooled and compared to controls ($p < 0.05$). The incidence was not dose-related and male mice were not affected. A chemically similar drug *in this class was administered to mice for 72 weeks at 25, 100, and 400 mg/kg body weight, which resulted* in mean serum drug levels approximately 3, 15, and 33 times higher than the mean human serum drug concentration (as total inhibitory activity) after a 40 mg oral dose. Liver carcinomas were significantly increased in high-dose females and mid- and high-dose males, with a maximum incidence of 90 percent in males. The incidence of adenomas of the liver was significantly increased in mid- and high-dose females. Drug treatment also significantly increased the incidence of lung adenomas in mid- and high-dose males and females. Adenomas of the eye Harderian gland (a gland of the eye of rodents) were significantly higher in high-dose mice than in controls. No evidence of mutagenicity was observed *in vitro*, with or without rat-liver metabolic activation, in the following studies: microbial mutagen tests, using mutant strains of *Salmonella typhimurium* or *Escherichia coli*; a forward mutation assay in L5178Y TK +/- mouse lymphoma cells; a chromosomal aberration test in hamster cells; and a gene conversion assay using *Saccharomyces cerevisiae*. In addition, there was no evidence of mutagenicity in either a dominant lethal test in mice or a micronucleus test in mice. In a study in rats, with daily doses up to 500 mg/kg, pravastatin did not produce any adverse effects on fertility or general reproductive performance. However, in a study with another HMG-CoA reductase inhibitor, there was decreased fertility in male rats treated for 34 weeks at 25 mg/kg body weight, although this effect was not observed in a subsequent fertility study when this same dose was administered for 11 weeks (the entire cycle of spermatogenesis, including epididymal maturation). In rats treated with this same reductase inhibitor at 180 mg/kg/day, seminiferous tubule degeneration (necrosis and loss of spermatogenic epithelium) was observed. Although not seen with pravastatin, two similar drugs in this class caused drug-related testicular atrophy, decreased spermatogenesis, spermatocytic degeneration, and giant cell formation in dogs. The clinical significance of these findings is unclear. **Pregnancy: Pregnancy Category X. —** *See* **CONTRAINDICATIONS.** Safety in pregnant women has not been established. Pravastatin was not teratogenic in rats at doses up to 1000 mg/kg daily or in rabbits at doses of up to 50 mg/kg daily. These doses resulted *in 20x (rabbit) or 240x (rat) the human exposure based on surface area (mg/meter²). However, in studies with* another HMG-CoA reductase inhibitor, skeletal malformations were observed in rats and mice. There has been one report of severe congenital bony deformity, tracheo-esophageal fistula, and anal atresia (Vater association) *in a baby born to a woman who took another HMG-CoA reductase inhibitor with* dextroamphetamine sulfate during the first trimester of pregnancy. PRAVACHOL (pravastatin sodium) should be administered to women of child-bearing potential only when such patients are highly unlikely to conceive and have been informed of the potential hazards. *If the woman becomes pregnant while taking PRAVACHOL* (pravastatin sodium), it should be discontinued and the patient advised again as to the potential hazards to the fetus. **Nursing Mothers —** A small amount of pravastatin is excreted in human breast milk. Because of the potential for serious adverse reactions in nursing infants, women taking PRAVACHOL should not nurse (see **CONTRAINDICATIONS**). **Pediatric Use —** Safety and effectiveness in individuals less than 18 years old have not been established. Hence, treatment in patients less than 18 years old is not recommended at this time. **ADVERSE REACTIONS:** Pravastatin is generally well tolerated; adverse reactions have usually been mild and transient. In 4-month long placebo-controlled trials, 1.7% of pravastatin-treated patients and 1.2% of placebo-treated patients were discontinued from treatment because of adverse experiences attributed to study drug therapy; this difference was not statistically significant. In long-term studies, the most common reasons for discontinuation were asymptomatic serum transaminase increases and mild, non-specific gastrointestinal complaints. During clinical trials the overall incidence of adverse events in the elderly was not different from the incidence observed in younger patients. **Adverse Clinical Events —** All adverse clinical events (regardless of attribution) reported in more than 2% of pravastatin-treated patients in the placebo-controlled trials are identified in the table below; also shown are the percentages of patients in whom these medical events were believed to be related or possibly related to the drug:

	All Events		Events Attributed to Study Drug	
Body System/Event	**Pravastatin (N = 900) %**	**Placebo (N = 411) %**	**Pravastatin (N = 900) %**	**Placebo (N = 411) %**
Cardiovascular				
Cardiac Chest Pain	4.0	3.4	0.1	0.0
Dermatologic Rash	4.0*	1.1	1.3	0.9
Gastrointestinal				
Nausea/Vomiting	7.3	7.1	2.9	3.4
Diarrhea	6.2	5.6	2.0	1.9
Abdominal Pain	5.4	6.9	2.0	3.9
Constipation	4.0	7.1	2.4	5.1
Flatulence	3.3	3.6	2.7	3.4
Heartburn	2.9	1.9	2.0	0.7
General				
Fatigue	3.8	3.4	1.9	1.0
Chest Pain	3.7	1.9	0.3	0.2
Influenza	2.4*	0.7	0.0	0.0
Musculoskeletal				
Localized Pain	10.0	9.0	1.4	1.5
Myalgia	2.7	1.0	0.6	0.0
Nervous System				
Headache	6.2	3.9	1.7*	0.2
Dizziness	3.3	3.2	1.0	0.5
Renal/Genitourinary				
Urinary Abnormality	2.4	2.9	0.7	1.2
Respiratory				
Common Cold	7.0	6.3	0.0	0.0
Rhinitis	4.0	4.1	0.1	0.0
Cough	2.6	1.7	0.1	0.0

*Statistically significantly different from placebo.

In the Pravastatin Primary Prevention Study (West of Scotland Coronary Prevention Study) (see **CLINICAL PHARMACOLOGY: Clinical Studies**) *involving 6595 patients treated with PRAVACHOL (pravastatin sodium)* (N = 3302) or placebo (n = 3293) the adverse event profile in the pravastatin group was comparable to that of the placebo group over the median 4.8 years of the study. The following effects have been reported with drugs in this class; not all the effects listed below have necessarily been associated with pravastatin therapy: *Skeletal:* myopathy, rhabdomyolysis, arthralgia. *Neurological:* dysfunction of certain cranial nerves (including alteration of taste, impairment of extra-ocular movement, facial paresis), tremor, vertigo, memory loss, paresthesia, peripheral neuropathy, peripheral nerve palsy, anxiety, insomnia, depression. *Hypersensitivity Reactions:* An apparent hypersensitivity syndrome has been reported rarely which has included one or more of the following features: anaphylaxis, angioedema, lupus erythematous-like syndrome, polymyalgia rheumatica, dermatomyositis, vasculitis, purpura, thrombocytopenia, leukopenia, hemolytic anemia, positive ANA, ESR increase, eosinophilia, arthritis, arthralgia, urticaria, asthenia, photosensitivity, fever, chills, flushing, malaise, dyspnea, toxic epidermal necrolysis, erythema multiforme, including Stevens-Johnson syndrome. *Gastrointestinal:* pancreatitis, hepatitis, including chronic active hepatitis, cholestatic jaundice, fatty change in liver, and, rarely, cirrhosis, fulminant hepatic necrosis, and hepatoma; anorexia, vomiting. *Skin:* alopecia, pruritus. A variety of skin changes (e.g., nodules, discoloration, dryness of skin/mucous membranes, changes to hair/nails) have been reported. *Reproductive:* gynecomastia, loss of libido, erectile dysfunction. *Eye:* progression of cataracts (lens opacities), ophthalmoplegia. *Laboratory Abnormalities*: elevated transaminases, alkaline phosphatase, and bilirubin; thyroid function abnormalities. **Laboratory Test Abnormalities —** Increases in serum transaminase (ALT, AST) values and CPK have been observed (see **WARNINGS**). Transient, asymptomatic eosinophilia has been reported. Eosinophil counts usually returned to normal despite continued therapy. Anemia, thrombocytopenia, and leukopenia have been reported with HMG-CoA reductase inhibitors. **Concomitant Therapy —** Pravastatin has been administered concurrently with cholestyramine, colestipol, nicotinic acid, probucol and gemfibrozil. Preliminary data suggest that the addition of either probucol or gemfibrozil to therapy with lovastatin or pravastatin is **not** associated with greater reduction in LDL-cholesterol than that achieved with lovastatin or pravastatin alone. No adverse reactions unique to the combination or in addition to those previously reported for each drug alone have been reported. *Myopathy and rhabdomyolysis (with or without acute renal failure) have been reported when another HMG-*CoA reductase inhibitor was used in combination with immunosuppressive drugs, gemfibrozil, erythromycin, or lipid-lowering doses of nicotinic acid. Concomitant therapy with HMG-CoA reductase inhibitors and these *agents is generally not recommended.* (See **WARNINGS: Skeletal Muscle** and **PRECAUTIONS: Drug Interactions**.) **OVERDOSAGE:** To date, there are two reported cases of overdosage with pravastatin, both of which were asymptomatic and not associated with clinical laboratory abnormalities. If an overdose occurs, it should be treated symptomatically and supportive measures should be instituted as required.

CAUTION: Federal (USA) law prohibits dispensing without prescription.

Consult package insert before prescribing PRAVACHOL® (pravastatin sodium).

Revised July 1996
D3-B001-7-96

J4-538D

Smithsonian Highlights

Planning a Smithsonian visit?

Receive a free Associates' planning packet. Write Smithsonian Information, Smithsonian Institution, Washington, D.C. 20560, or call 202-357-2700 (voice) or 202-357-1729 (TTY), 9 A.M. - 5 P.M., Monday-Friday; 10 A.M. - 4 P.M., Saturday-Sunday. Note: Parking near the Smithsonian is limited. The Metrorail subway system is convenient to all museums (details in packet).

Begin your visit at the Smithsonian Information Center's Associates' Reception Desk—open 9 A.M. - 4 P.M. daily—in the Castle. Special materials await you there. The Court dining room in the National Museum of Natural History is permanently closed. Associates may now avail themselves of a discount on table service at the National Air and Space Museum's Wright Place restaurant, open 11:30 A.M. - 3 P.M. daily.

The Smithsonian home page on the World Wide Web (http://www.si.edu) offers on-line information about exhibitions, collections, research, events and products.

Museum Hours

Smithsonian museums are generally open 10 A.M. - 5:30 P.M. daily, except December 25. Hours at the National Zoo are 9 A.M. - 4:30 P.M. daily for buildings, and 8 A.M. - 6 P.M. for grounds.

Smithsonian Musical Weekend

The 25th annual Smithsonian Musical Weekend will be held April 25-27. Highlights of this anniversary year will include gala receptions and dinners, concerts, and a performance of *The King and I* at the Kennedy Center. Call (202) 973-2150, or write Friends of Music, P.O. Box 14445, Washington, D.C. 20044, before March 15.

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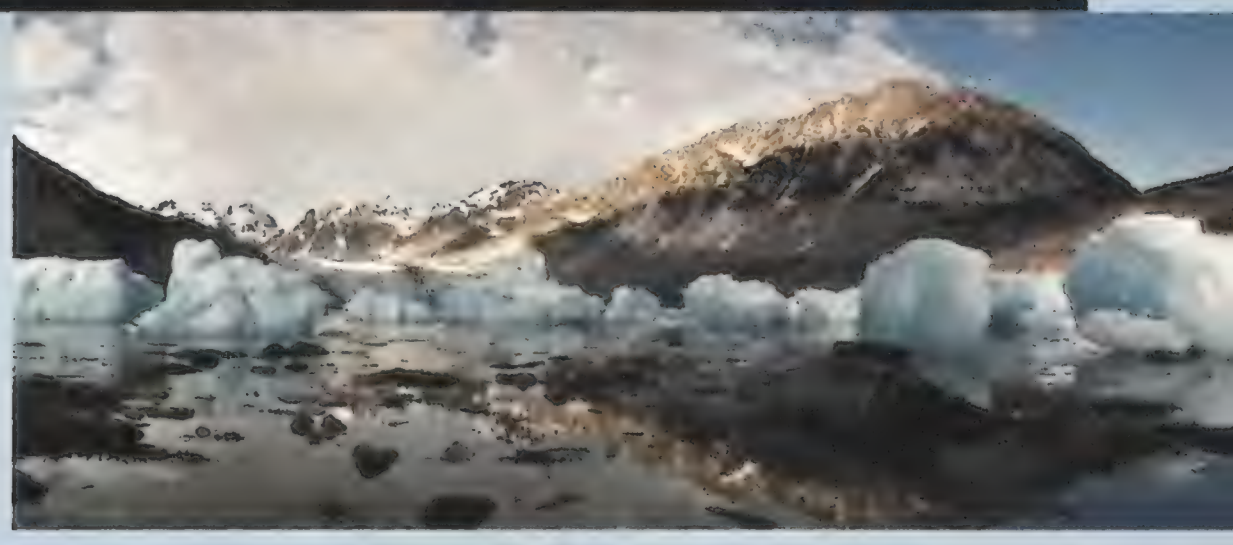

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BLANCHARD

Special March Exhibitions, Events

National Museum of American History
24 Hours in Cyberspace (through April) Photographs document the harmonies and paradoxes of life in cyberspace. See *Highlights Continued*, page 36.
Serving Home and Community: Women of Southern Appalachia (opens March 1) Photographs by Barbara T. Beirne.

National Postal Museum (Located next to Union Station on Capitol Hill)
New Deal Architecture (runs indefinitely) Vintage photographs illustrate the architectural styles of various federal post office buildings.

National Air and Space Museum
Star Wars (through March 30) Display case includes costumes and character models from the movie.
The Enola Gay (runs indefinitely) Exhibition features the forward fuselage of the *Enola Gay*, the B-29 that dropped the atomic bomb on Hiroshima.
Cosmic Voyage (10:45 A.M., 12:55, 3:05 and 5 P.M. daily) Imax film explores the known dimensions of the Universe.

National Museum of Natural History
Poles Apart: Parallel Visions of the Arctic and Antarctic (through August 4) Photographs by Galen Rowell depict the terrains and inhabitants of the North and South Polar regions.
Gems and Minerals Hall Gallery is closed for renovation until September 1997. The famous Hope Diamond is on view on the second floor of the Rotunda.

National Zoological Park
Amazonia Science Gallery New permanent exhibition looks at the work of Smithsonian biologists worldwide.

Freer Gallery of Art
Ancient Chinese Pottery and Bronze (opens March 7) Show illustrates the close relationship between the ancient ceramic and bronze industries in China.
Korean Ceramics (opens March 1) Exhibition of works dating from the first century to 1910 explores the role of ceramics in Korean culture.

Arthur M. Sackler Gallery
The Bridge: Illusion in Clay (March 2-July 6) A 60-foot-long, life-size ceramic sculpture, titled *The Bridge*, by contemporary Taiwan artist Ah-Leon.
Preserving Ancient Statues from Jordan (through April 6) Plaster statues (c. 7000 B.C.) from an ongoing excavation.

National Museum of African Art
A King and His Cloth: Asantehene Agyeman Prempeh I (through March 23) Exhibition examines an "Adinkra" cloth owned by Asantehene Agyeman Prempeh I, king of the Asante nation in Ghana from 1888 to 1896.

Hirshhorn Museum & Sculpture Garden
Directions—Juan Munõz (March 6-June 15) Installations by the Madrid-based sculptor feature interacting cast-resin figures.

National Portrait Gallery
Red, Hot & Blue: A Salute to American Musicals (through July 6) Exhibition spotlights the major personalities who created the American musical theater.

National Museum of American Art
American Photographs: The First Century (through April 20) Daguerreotypes, ambrotypes, tintypes, from the museum's Charles Isaacs Collection.

Renwick Gallery
The Renwick at Twenty-Five (March 14-July 13) Show celebrating the Renwick's 25th anniversary presents some of the finest achievements in recent craft.

Arts and Industries Building
Feeling the Spirit: Searching the World for the People of Africa and *Invoking the Spirit: Worship Traditions in the African World* (through March 23) Photographs by Chester Higgins jr.
The Black Trans-Atlantic Experience (through March 23) Images by photographer Steven Marc.
Stories of the People (through August 10) Artifacts from the collection of the National Museum of the American Indian.

The Castle—Information Center
Smithson's Gift Permanent display tells the story of the British scientist whose bequest founded the Smithsonian.

Anacostia Museum
The museum is closed until fall 1997.

Heye Center, National Museum of the American Indian (New York City)
Agayuliyararput (Our Way of Making Prayer): The Living Tradition of Yup'ik Masks (March 2-August 17) Exhibition of masks made by Yup'ik Eskimos.

Cooper-Hewitt, National Design Museum (New York City)
Henry Dreyfuss: Directing Design (March 18-August 17) Sketches, models and more by the industrial designer and his firm.

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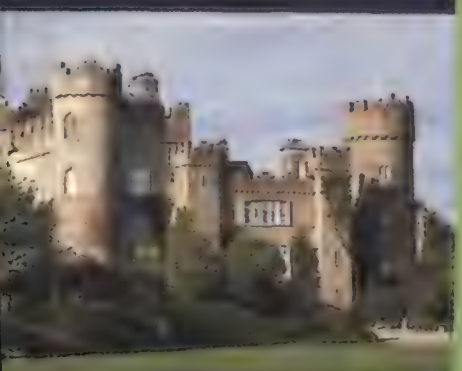

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Highlights Continued

A photographic time capsule of life on-line

From the jungles of Chiapas, Mexico, Zapatista rebels use their Website *Ya Basta* (Enough Already) to attract global attention. In a Michigan classroom, students interact with archaeologists excavating a fourth-century monastery in Egypt. As The Motley Fool, two brothers dole out on-line investment advice, and on their Hot Hot Hot Website, a Pasadena couple market their specialty foods. Rabbis, it seems, do it, monks do it, even the Dalai Lama has a presence on the Web. How and why do they use cyberspace? How is this digital revolution changing the way we work, play, meet, learn and conduct business? On February 8, 1996, Rick Smolan, creator of the "Day in the Life" books, dispatched 150 photojournalists around the globe to chronicle life on-line. "Our goal," says Smolan, "was to focus on the human face of cyberspace, to produce a 'digital snapshot' of this borderless new medium." These images can now be seen in a special show, "24 Hours in Cyberspace," at the National Museum of American History, through April, and in a book of the same name. They can also be accessed on-line at http://www.cyber24.com.
Diane M. Bolz

From the solitude of the Holy Cross Abbey in Berryville, Virginia, a monk (top) works as an electronic scrivener on the Internet. Canadian writer Carolyn Burke (above) started her popular Website, Carolyn's Diary, in 1995.

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The grave at Vukovar

A war crimes tribunal sent forensic scientists to investigate mass graves like this one in the former Yugoslavia. What happened here?

One morning last September, a convoy of United Nations vehicles left the Croatian city of Vukovar and headed into farmlands along the banks of the Danube River. Turning off the main road at a sign for Ovcara, they rumbled past a row of weathered farmhouses, and then turned onto a dirt track. The vehicles drove along the edge of a field, swerving occasionally to avoid potholes, until they pulled to a stop at the end of a wooded ravine and a tall man in a green felt hat and cowboy boots stepped out into the cool autumn air.

Clyde Snow paused to light a cigarette, as much to ward off the acrid smell that now stung his nostrils as out of habit. At 68 the slow-talking, quick-witted Texan is somewhat of a legend in the world of forensic anthropology. Snow spent the 1960s and '70s studying air crashes and researching aviation safety as a staff anthropologist with the Federal Aviation Administration. In the early 1960s, he began moonlighting as a scientific detective. "Bones," he said once, "are often our last and best witnesses: they never lie, and they never forget." Among his higher-profile cases have been the identification of some of the victims of Illinois serial killer John Wayne Gacy and the examination in Brazil of skeletal remains of the infamous Nazi doctor Josef Mengele. In more recent years, Snow has helped train archaeologists and medical students in Argentina and Guatemala to exhume and identify the bodies of political dissidents who have been killed there. Few people in Snow's profession have ever used their skills as he has to expose atrocities committed by governments. Of all the forms of murder, Snow has come to believe, none is more monstrous than that committed by the state against its own citizens.

Snow gathered up his leather bag, heavy with the anthropometric tools he uses to learn the secrets of the bones he studies. The scene around him looked more like an armed camp than an archaeological dig. Razor-sharp concertina wire stretched across the ravine and coiled along the edge of the field to a cluster of trailers and military vehicles. At the northern end of the encampment, next to a large white canvas tent, a group of Jordanian soldiers in U.N. flak jackets huddled around a charcoal stove. Nearby, a soldier cradling a machine gun stood alert atop an armed personnel carrier.

Inside the barbed-wire perimeter, a windowless container about the size of a boxcar sat apart from the other structures in the compound. Its stainless-steel doors were held shut by a heavy padlock. A mobile generator fed electricity to the container's refrigeration system.

Snow walked past the container and slipped under the flaps of the tent. He made his way along wooden planks

By Eric Stover
Photographs By Gilles Peress/Magnum

Above: William Haglund, left, and Clyde Snow share a pensive moment reflecting on their investigation. The work is both physically and emotionally exhausting.

to the edge of a large hole and looked down on several men and women who had begun working below. When a backhoe wasn't grinding its gears nearby, he could hear the sound of trowels scraping at the earth and the creaking of a wheelbarrow being pushed up a long ramp of packed dirt.

Three men, dressed in dark blue overalls and black knee-high rubber boots, their hands protected with tight-fitting latex gloves, tugged gently at the arms of a corpse, trying to untangle it from a mass of other bodies. Once it was freed, the group's leader leaned over it and spoke softly into a small tape recorder in his right hand: "Body 36 is a young adult male, partially decomposed . . . left arm bandaged . . . sweatshirt, light green in color, with red shoulder patches . . . brown trousers and black belt." When he finished, his colleagues placed the body in a white bag and wrote "Ovcara 36" on its side. They then carried it up the ramp and deposited it in the refrigeration container.

For four years, Snow had struggled to find out exactly what happened at the Ovcara farm. In May 1993, the U.N. Security Council had established an international war crimes tribunal in The Hague—the first of its kind since the Nuremberg and Tokyo trials following World War II—to investigate crimes in the former Yugoslavia. This past June the tribunal sent William Haglund, a forensic anthropologist from Seattle, to the Balkans to resume an investigation of the Ovcara site begun by Snow and to exhume four of nine mass graves that had been discovered in the hills surrounding Srebrenica. Over the next five months, Haglund, with the aid of Boston-based Physicians for Human Rights, shuttled dozens of forensic scientists from 19 countries in and out of the region in what soon developed into the largest forensic investigation of war crimes—or possibly of any crime—in history.

The Ovcara investigators faced one major obstacle: only the victims and the perpetrators could recount the events that took place at the end of the ravine, and the former were dead and the latter remained silent. But all murderers share the same trait: they drop a trail of physical clues, which, when properly collected, preserved and analyzed, are as damning as a signed confession left in the grave.

Snow first learned about the incident at Ovcara during a trip to Zagreb in October 1992, as part of a U.N. team that was investigating reports of war crimes in the former Yugoslavia. At the end of a meeting with the dean of Zagreb's medical school, Snow was introduced to "Marko," who claimed he was the survivor of a massacre that had taken place the year before.

Marko's account began in Vukovar, a historic town on Croatia's eastern border. For years Serbs and Croats had lived there together peacefully. Croatia and five other republics and two autonomous provinces had

Eric Stover has investigated war crimes in the former Yugoslavia since 1992. He is director of the Human Rights Center, University of California at Berkeley.

Argentine forensic expert Luis Fondebrider (left) delineates remains so they can be removed. Jordanian soldiers (above) patrol the road to the Ovcara grave.

joined after World War I to form modern Yugoslavia, and Josip Broz, known as Tito, held them together from 1945 until his death in 1980. But by the late 1980s, hardline nationalist sentiment had gained momentum in several republics, stirring old ethnic animosities.

On June 25, 1991, Croatia and Slovenia declared their independence from Yugoslavia. The Yugoslav National Army, or JNA, composed mostly of Serbs, was ordered to subdue the breakaway republics. It wasn't long before Vukovar was attacked. Marko, who had joined the Croatian Guard defending the city, was wounded by shrapnel. He joined the hundreds of civilians and fighters who took refuge in the Vukovar hospital as defense lines around the city crumbled.

After Vukovar fell to the Serbs in mid-November, the JNA commander agreed to let the International Committee of the Red Cross monitor an evacuation of the hospital. But on the morning of the 20th, as Red Cross officials waited helplessly outside, JNA soldiers and irregulars hurriedly removed about 200 patients and staff, including Marko, from the hospital and drove them out to the farm complex called Ovcara.

"They hit us with clubs and gun barrels," Marko recalled. "I remember one man on crutches who was ordered to sing Serbian songs. If any soldier didn't like the way the guy was singing, he would beat him with his own crutches." By dusk, two men, including the man on crutches, had been beaten to death.

As night fell, a military truck pulled up to the farm and 20 people were taken away. Ten or fifteen minutes later, the truck returned for another load. Marko left with the third or fourth group of men. Several hundred yards down the road, the truck suddenly slowed and turned left onto a dirt track. Fear gripped Marko. "We've got to jump," he said to the other men. As the truck lurched forward, Marko leapt into the darkness. Running through the fields a few minutes later, he heard a burst of gunfire.

Three days after his interview with Marko, Clyde Snow, accompanied by Sgt. Larry Moore, a Canadian Mountie seconded to the U.N., made his way through Serb-held territory to the Ovcara farm. Near the head of a ravine, on a low, soggy patch of bare earth, he spotted a human skull lying face up in the mud. Its jaw hung open, as if screaming at the sky.

Two months later, as director of Physicians for Human Rights, I accompanied Snow and two colleagues to the Ovcara farm. We worked quickly, aware that the Serbs might confront us at any time. As U.N. troops stood guard, we unearthed the skull and the rest of the remains from the mud. Below the skull, resting on the shoulder bones, was a silver chain bearing a Roman Catholic cross and a silver-colored medallion with the inscription: "BOG I HRVATI." Or, in English, "God and Croats." We knew this would be a valuable clue in identifying the body.

Walking through the underbrush we found another skeleton and the rough edges of what appeared to be a large grave. We dug a meter-wide trench across the site.

Judging from the grave's size and depth, we concluded that it could easily hold as many as 200 bodies. Before leaving, we placed the skeletons in separate plastic bags, labeled them "Ovcara 1" and "Ovcara 2" and reburied them in the trench.

Wars often result in a variety of mass burials. Victorious troops may collect enemy dead and, though a violation of the rules of war, dump them in mass graves. But the Ovcara grave had nothing to do with battlefield casualties. On the grave's northwestern perimeter were well over 75 spent cartridges of a caliber consistent with a standard JNA weapon. The fact that we found cartridge casings only along this perimeter, and that there were bullet holes in the acacia trees on the opposite side, suggested that a firing squad had stood at one end of the grave shooting directly into or across it.

Determined to complete the excavation at Ovcara, Snow and I returned to Croatia in October 1993, this time with a team of forensic scientists and a detachment of U.N. soldiers who were to provide us with security and logistical support. Snow took a team to a village in western Croatia, where they exhumed 19 bodies all believed to be Serbs. They were reportedly executed by order of a local Croatian commander. I led a group to Vukovar with two U.N. human rights officials who brought agreements, signed by military and civilian authorities, granting us permission to exhume the Ovcara grave. Or so we thought.

After three days of waiting, we were summoned to meet with the local Serb commander. The Serbs governing Vukovar had passed a resolution the day before prohibiting any further work at the Ovcara grave, we were informed. "Your papers from Belgrade mean nothing. You must leave at once."

On December 14, 1995, the presidents of Bosnia-Herzegovina, Croatia and Serbia signed an American-brokered peace agreement in Paris, ending four years of war. The peace accord allowed for the deployment in Bosnia of a multinational Implementation Force (IFOR), to keep dissident factions at bay and to protect war crimes investigators. The way was paved for the forensic scientists to do their work.

At about 9 A.M. each morning, two U.N. vans would pull into the barbed-wire enclosure at the Ovcara site, disgorging an international crew of scientists and tribunal investigators, including archaeologists from Argentina, Chile and Guatemala who had been Snow's protégés.

Donning overalls and rubber boots, the archaeologists would remove the tarps that had been draped over the bodies the evening before and gather the tools of the trade from a storage container: shovels and plastic buckets filled with trowels, brushes of all sizes and shapes, twine, small plastic evidence bags, red marker flags, tape measures, spoons, and even chopsticks. The archaeologists then settled into their own particular corners of the grave.

As the day wore on, they often lost track of time, pausing only occasionally to sip coffee and compare notes. The work was slow and painstaking. Exposing a body with trowels and brushes, then photographing it and mapping its placement onto the electronic surveying system could easily consume half a day. But attention to detail is the key to all forensic work: "Lose one tooth or even a foot bone," Snow has often repeated like a mantra, "and you're an accomplice to the crime."

The Ovcara workers were applying many of the same procedures that they would use to study patterns of human behavior at any archaeological dig. Reconstructing human behavior from physical evidence is like piecing together a multidimensional puzzle. Pieces of the puzzle may be missing, damaged, or even camouflaged, but each piece has its place. Traditionally, archaeolo-

A picture (above) was salvaged from a Roman Catholic cathedral reduced to rubble in the Vukovar siege. A carved dove (below) lies amid the ruins. Trucks from the hospital traveled the dirt road on the Ovcara farm.

gists have used strings and stakes to lay out a grid over an area under study. The squares serve as reference points for "piece plotting" the locations of bodies or artifacts. The locations of these objects are then recorded on a site map. It is a tedious, time-consuming process.

All of that began to change with the introduction of a revolutionary new electronic surveying system. Melissa Connor and her husband, Doug Scott, archaeologists with the U.S. National Park Service, were among the first to adapt the technology for archaeological use when they began working with it in 1984. Directing the surveying work at the Ovcara grave, Connor and Scott use a surveying station that includes a combination transit and electronic distance meter mounted on a tripod. A metal pole is aligned directly over an object in the grave. A beam of invisible light bounces off mirrors in a small box on top of the pole and back to the transit and distance meter, which calculates the artifact's coordinates. These are recorded in an electronic notebook and later entered into a computer, which generates a map. Not only does the surveying station save time, it produces more accurate data.

"You see the cluster of small red circles here?" Connor asked me, pointing to the side of her computer screen. "Those are cartridge casings. Now as we move across the grave to the eastern perimeter, you see there are fewer and fewer. This could indicate that the firing line was positioned as you had suspected." Connor's computerized maps also showed cartridge casings between the bodies in the grave, corroborating Marko's inference that the men had been executed in groups.

Evidence continued to mount to substantiate Marko's story. As they dug deeper, workers discovered bodies wearing hospital smocks and white clogs, footwear common to hospital employees in Croatia. Some of the bodies bore signs of previous injuries: a thigh bandaged in

William Haglund struggles to extract a body from a mass grave on a farm outside Srebrenica. As many as 7,000 men are said to be missing since the city was taken by the Bosnian Serb army in July 1995.

gauze or a broken arm set in a plaster cast and sling. A pair of broken crutches lay on top of one body. Another had a catheter dangling from its pelvis.

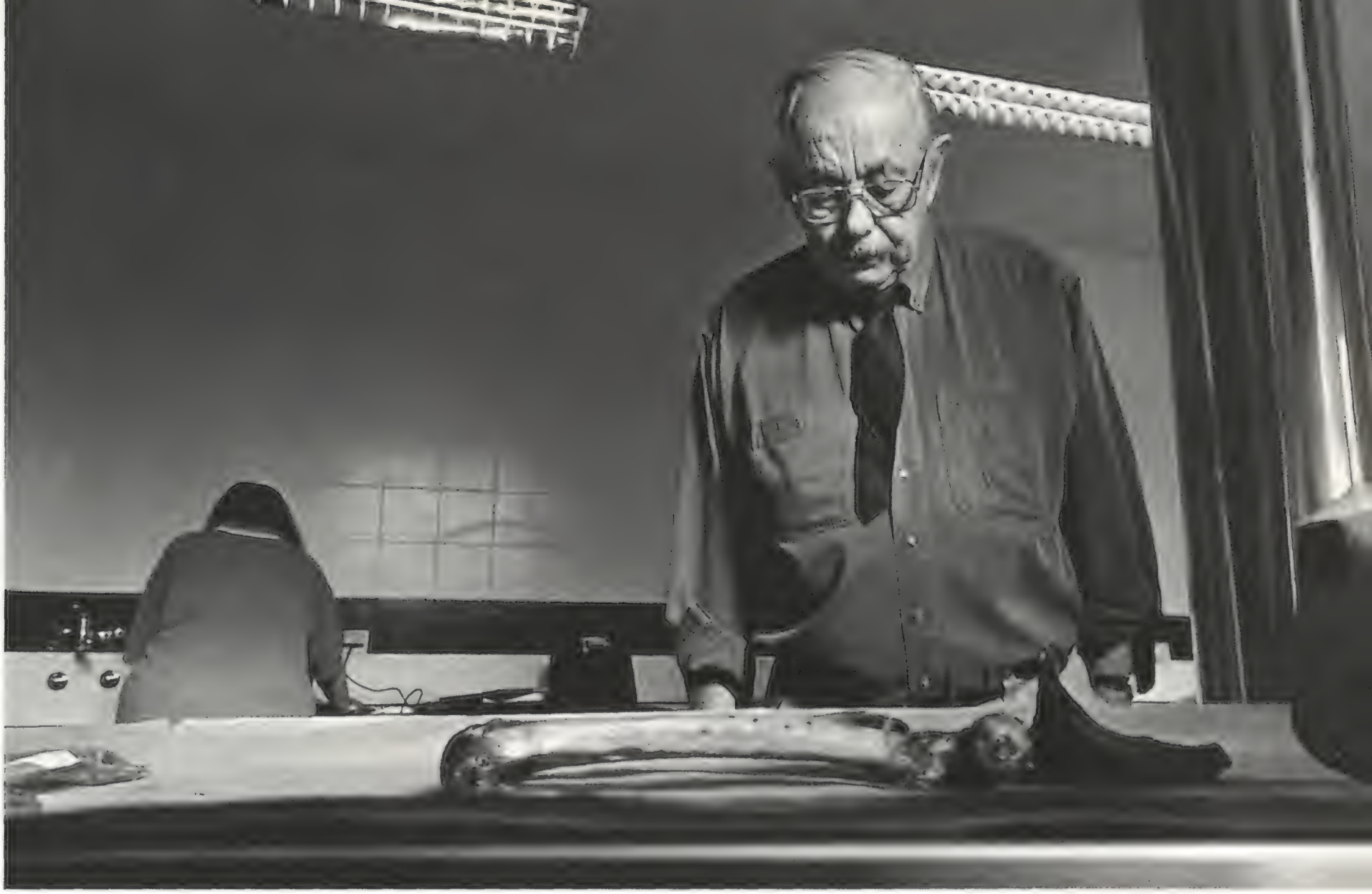
For the scientists, who toiled only inches away from the bodies, it was exacting work, physically and emotionally. Haglund, his forehead and graying beard glistening with beads of sweat, placed his hands on his hips and arched his back as he stood up in the grave. "It's not fun down here," he said, slumping down in an empty wheelbarrow next to his Guatemalan colleague, Fernando Moscoso. "You're basically immersed in this grave," he said, his eyes clouding. "You're like a living tentacle that's lifting, reaching around all this death, trying to pull it out."

For the past hour Haglund and Moscoso had tried without success to disentangle the arms and legs of two bodies that were embracing each other in the grave. Many of the victims had probably lived for several minutes or even hours after they were shot. In a futile attempt to escape or perhaps to hug life, they had clung to one another and became almost inextricably entwined. "Constantly seeing their faces, their arms and legs contorted and twisted over one another, that's what really gets to you," said Moscoso. "At night, when I close my eyes I still see them." At the end of the day, Haglund often retreated with his guitar, playing bluegrass and folk music "for therapy," he said. "For my soul."

As Haglund worked in the countryside, Clyde Snow set up shop in a university morgue in Zagreb that was under temporary U.N. jurisdiction. A group of Croats, mostly medical students, had been tracking down and interviewing relatives of the missing patients and staff from the Vukovar hospital. A crate next to the anthropologist's desk was piled high with interview forms and dental charts. He spent his days and evenings hunched over his laptop computer, punching this information into a database.

Snow had developed the database years earlier, during the investigation of an airline crash. Faced with the need to come up with a better system to keep track of information on the victims, Snow created a computer program to store antemortem and postmortem data. Into it went a complete list of the "medical biographies" collected from families of the passengers, and an anthropological and dental portrait of each victim—anything that could distinguish one body from another. Over the years he continually updated the program, the last time during the investigation of the bombing in Oklahoma City in 1995.

As Snow tapped away at his computer, a refrigerator truck occasionally arrived at the morgue, bearing more



At a morgue in Zagreb, Clyde Snow contemplates a femur as he parses the bones of a victim of the Ovcara massacre. His examination will help him determine attributes that may tentatively identify the dead person.

bodies from the Ovcara grave. It was after one such delivery that he discovered the bag containing the skeleton he had examined at the site four years earlier. After carefully washing each bone, he laid them out in anatomical order on an examining table and began a process he calls parsing the skeleton. Are the remains human? When did the death occur? What is the deceased's medical and anthropological biography? What was the cause of death—blunt force trauma, a wound, heart failure or cancer? And, finally, what was the manner of death?

Next to the identification of the remains, the most important task for a forensic anthropologist is to determine the cause and manner of death. The distinction between the two terms is important. An autopsy may reveal that the cause of death of a body fished from a river was drowning. If the cause also involved an obvious blow to the head, the manner of death is suggested. The five possibilities are homicide, suicide, accident, natural or simply undetermined.

Snow began his examination of Ovcara 1 by trying to determine the skeleton's racial characteristics and sex. Lifting the skull in his hands, Snow could see that most of its structural traits, such as the small cheekbones and straight facial profile, indicated that the skull was Caucasoid. Turning the skull downward, he inspected the mastoid processes, the two protrusions of the temporal bones that can be felt directly behind the ear. They were big enough to be a male's. He tilted the skull back slightly to look at the nuchal crest, the ridge at the nape of the neck. It was too well developed to be female.

Setting the skull aside, Snow turned to the two innominate, or hip, bones. These, along with the sacrum and coccyx, make up the pelvis. To the trained eye these bones are far more reliable than the skull for visually determining the sex of a skeleton. For example, the mature male pelvis is usually more robust, with well-marked muscular impressions. The female's pubic opening is broader. At the point where the two hipbones meet lies the pubic symphysis, the joint that connects them. Below this joint, the angle formed by the hipbones is narrower in males.

Turning one of the hipbones over, Snow followed the contour of the edge of the bone to find the sciatic notch, about as wide as a quarter. It was comparatively narrow and deep. He also examined the socket in the hipbone that receives the head of the femur. Its diameter was wide and its borders well developed. These were distinctly male traits.

Next, Snow looked for signs of handedness. Over

time, the posterior margin of the scapula takes on a more beveled appearance because of the greater use of the joint on the dominant side. And using one arm more often causes the bones of that arm to grow slightly longer. The wear in the Ovcara skeleton's shoulder socket and the length of the arm bones made handedness, Snow said, "too close to call."

Snow turned to stature and age at death. Height was relatively straightforward. Taking the combined lengths of the femur and tibia and applying them to statistical regression tables, he came up with a stature of 178 centimeters with a standard deviation of plus or minus 6 centimeters. Aging a skeleton is somewhat more problematic. The best predictor for age is the degree of change on three specific sections of the pubic symphysis. The sections change independently of each other and at different rates. Anthropologists assign each section a number. Taken together, these numerical scores can determine age at death within a range of several years.

Snow reached into his leather carrying case and set a felt-lined wooden box on the plywood table. Inside were 15 plastic casts of symphyses, each of them showing the six growth stages for the three sections. Comparing the plastic casts with the skeleton's symphysis, he came up with a numerical reading that corresponded to a pubic age of about 21 to 25 years. But looking at the collarbones and the ends of the ribs, which also offer clues to age, he widened his estimate to 22 to 28 years.

Picking up the skull again, Snow inspected a small, inwardly beveled hole at its base—the entrance wound of a bullet. Turning the skull over, he saw two larger holes, big enough to slip a finger through. He held a magnifying glass up to the edges of the openings. Bone had chipped away, leaving outward beveling. The entering bullet had passed through the brain and split into two fragments, which then exited the skull.

Late one afternoon, as a Jordanian soldier laid out his prayer rug on top of the armed personnel carrier, Haglund and his team, exhausted but relieved to have removed the last body from the pit, gathered at the grave. They discussed how ironic it was that they had worked for nearly six weeks excavating the grave, when the killers had most likely taken only a few hours to dig it. But it wasn't long before the conversation drifted into rougher waters. In recent days some of the scientists, emotionally frayed and wearied by the grueling pace,

had begun to question openly the value of their investigation. Was it possible that no one could ever be arrested for these crimes? Didn't the families have a right to see justice done? "You know," Snow mused, "sometimes I wish I'd never found this grave. But I did, and now in a way, it's kind of sad seeing what we expected all along being exposed here." He paused, searching for the right words. "A terrible crime happened in this place," he finally said. "And having come this far, I hope it doesn't go unpunished."

In March 1996, three months before Haglund's team began their exhumations in Croatia and Bosnia, Madeleine Albright, the U.S. Ambassador to the United Nations at the time, visited what was then a suspected mass grave near the town of Srebrenica. Parts of a skeleton could be seen at the site. Referring to then Bosnian Serb president Radovan Karadzic and his army commander, Gen. Ratko Mladic, both already indicted in July 1995 for war crimes and acts of genocide but so far not arrested, Albright said: "Mladic and Karadzic need to know that their days of roaming around are numbered." But, as of January 1997, these men and dozens of other indicted war criminals, including those charged with the Ovcara killings, remained at large; some of them were even within a few miles of the excavation sites, living remarkably ordinary and open lives.

"What troubles me," Haglund told his colleagues at the grave, "is that these people may have died in vain. Without justice, all of this will end up being a mockery of the dead and of all that we've tried to accomplish."

Early one morning, photographer Gilles Peress and I left the Ovcara farm and traveled south into Bosnia, passing through a series of IFOR checkpoints manned by young American soldiers looking bored and uncomfortable in their helmets and heavy flak jackets. Finally we pulled into the parking lot of a bombed-out sewing factory where a makeshift morgue had been set up for the bodies exhumed from four of the mass graves in the hills around Srebrenica.

Tim Curran, a former Vermont police officer trained in forensic science and crime scene investigation, showed us some of the personal items he had recovered from the bodies. He fished out a set of keys and a homemade tobacco tin from one bag and a wedding band and a pocket watch from another.

Curran laid out several papers and stacks of pho-

Clothes removed from the bodies were examined, then washed. A color photograph was taken and everything catalogued and stored. Personal items like the small pouch above, many of which were found around the necks of Muslim men at Srebrenica, were also documented.

An instant-camera memento of a happy day was found in the pocket of one Srebrenica victim. A bullet hole mars the left corner.

tographs. A Dear John letter, its pages crumpled and frayed. A soiled bankbook. A child's drawing of a little girl holding an umbrella. I leaned over the table and took a closer look at a snapshot of a young woman kneeling next to two small children, her face radiant. It was an intimate scene, so commonplace and familiar, it could have been taken anywhere. The upper-left-hand side of the photograph was gouged. I looked up at Curran. "It's a bullet hole," he confirmed.

Identifying more than 400 bodies exhumed from the graves around Srebrenica was not going to be easy. No one knew better than Laurie Vollen. A public health physician from Wisconsin, she is the director of the Physicians for Human Rights' antemortem database project. Vollen trained 28 Bosnian women and men in how to interview the relatives of the missing to gather physical descriptions. They were also taught to recognize feelings of guilt and helplessness, which they themselves may develop after hearing so many tragic stories.

Vollen told me of a woman she interviewed who had lost her husband, her brother and her son in the siege of Srebrenica. At the end of the interview, Vollen related, the woman asked "if we could bring to her one bone from her son: she would carry it in her purse wherever she went, and at night she would put it beside her. She said that was the most important thing we could do for her."

Vollen and her team were locked in a race against time. Many of the refugee women were now leaving the displaced persons centers. In addition, many medical and dental records held by the Serbs were not being made available. "DNA testing may be our last, best hope to confirm identifications," Vollen said.

During autopsies the forensic experts had removed teeth and sections of bone from the Srebrenica bodies and had sent them to the laboratories of Mary-Claire King, a molecular geneticist at the University of Washington. Michelle Harvey, a geneticist with Physicians for Human Rights, extracts DNA from these samples to compare it with DNA in blood samples taken from the relatives. It remains to be seen whether DNA testing will be able to identify many of the Srebrenica men.

By late November 1996, the investigations were winding down at the sites. In Croatia and Bosnia, families of the victims waited anxiously for the results, as did the chief prosecutor of the war crimes tribunal. So far, the Srebrenica team, as expected, had identified only a few of the more than 400 bodies. Even so, their findings on the cause and manner of death disproved claims by Serb military and political leaders that they were military casualties. Most of the men had wounds consistent with execution killings. Many of the corpses bore blindfolds and had their hands tied behind their backs. The clothing and personal items recovered from the bodies indicated that many, if not most, of the victims were Muslims, suggesting not only mass murder, but genocide. Of the 200 bodies removed from the Ovcara grave, more than 50 had been tentatively identified as patients or staff at the Vukovar hospital. Once DNA testing was completed, the bodies would be returned to the families.

Toward the end of our trip, Peress and I drove to Zagreb to see Clyde Snow. We found him at the morgue,

Caught in a limbo between hope and grief, women of Srebrenica await news of their lost loved ones.

bent over his laptop. Plastic cups half-filled with dark coffee sat precariously on mounds of paper. An ashtray at his elbow was brimming with cigarette butts. Even though it was late in the afternoon, he still had on his hat and coat. He seemed both obsessed and excited.

Motioning us to his desk, Snow scrolled across his computer screen until he hit a column on the antemortem database entitled "Personal Effects." He punched in the letter *N*, for "necklace," and a list of abbreviated words flickered onto the screen. He scrolled down the list and stopped. "Does this look familiar?" he asked, looking up and smiling. "SILV. CHAIN+CROSS+ PLATE (INSCR. "BOG I HRVATI") stood out in bold letters on the screen.

Laying an autopsy report on the desk next to his computer, he moved his index finger along the notations for age, sex, stature and race while he scrolled along similar categories on the screen: they all matched. When he reached "handedness," which during the autopsy had been too close to call, the screen showed "ambidextrous," another match. Everything matched. Ovcara 1's family could finally learn his fate.

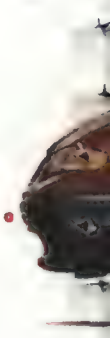
THE FINE ART OF MESSING WITH SUCCESS.

February 26, 1992: Chrysler minivans are named top safety choice in the passenger van category in Prevention magazine's Safe Car of the Year Awards.

August 1, 1996: Chrysler Town & Country minivan named top safety choice in the 1995 passenger van category by Prevention magazine. (Anyone see a pattern developing here?)

November 1, 1995: New Dodge Caravan is named Motor Trend's Car of the Year—first time a minivan wins the award. Second straight year that a Chrysler Corporation vehicle has won.

October 11, 1995: Accompanied by the Whetstone HS Marching Band, Chrysler CEO Bob Eaton delivers the five-millionth Chrysler Corporation minivan to the Lomband family of Columbus, Ohio.

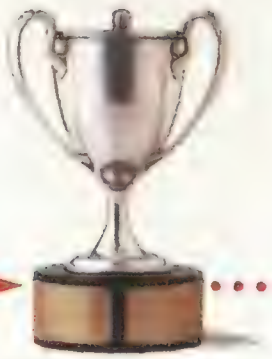


Having invented the category, we at Chrysler Corporation knew that tampering with something as popular as our minivan would be a delicate operation. (Of course, introducing it in the first place was a bit chancy too.) But what we finally decided was that the greater risk was resting on our laurels. When making great cars

Visit our World Wide Web site at http://www.chryslercorp.com, or call toll-free 1-888-GREATCARS. **Chrysler minivan owner loyalty at 63% in compilation (January, February, March) sales period. †Always wear your seat belt.*

May 15, 1992:
Multidisciplinary platform team convenes to begin work on the next generation of the minivan.

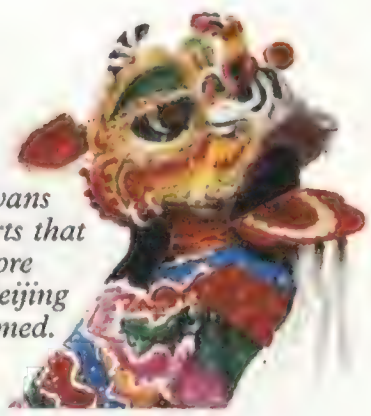
August 1, 1992:
Dodge and Plymouth minivans get optional sport handling suspension. Car pools across America become approximately 37% less boring.



September 18, 1992:
*Consumer Attitude Research announces that Chrysler minivans have the highest repeat purchase rate of any platform sold in the United States.**

July 15, 1992:
Platform team reads letters from minivan owners asking, "Why not put a sliding door on the driver's side too?"

May 9, 1993:
Sales of Chrysler minivans in Asia pass 2,000. Reports that minivan interior is more spacious than average Beijing apartment are unconfirmed.



March 10, 1995:
Redesigned Chrysler, Plymouth, and Dodge minivans reach dealerships with features including dual front air bags,† optional dual sliding doors, Easy Out Roller Seats,™ and enough storage space for the most acquisitive of families.

April 18, 1994:
Fuel-door problem solved. (Sorry, but if we told you how, we'd have to kill you.)

September 15, 1993:
Problem: How to keep driver's-side sliding door from banging into fuel door.

and trucks is your goal, the right decision is usually fairly obvious. Kind of like the idea of putting a sliding door on both sides of your minivan, come to think of it.

of 62,583 new car and light truck buyers conducted during the '92 second-quarter

GREAT CARS. GREAT TRUCKS.

CHRYSLER CORPORATION

An orphanage for some big babies

Daphne Sheldrick has turned her Nairobi home into a nursery and rehabilitation center for infant elephants who have lost their families

Zoe, the robust elephant chugging down her infant formula, opposite, was just 2 weeks old when a game warden spotted her wandering in a village market near Kenya's Tsavo National Park in December 1995. The badly decomposed body of the infant's mother was found nearby. The baby elephant was driven by truck to a most unusual orphanage in Nairobi, run by a woman named Daphne Sheldrick.

The wife of the late David Sheldrick, founder and warden of Tsavo National Park, Sheldrick has been working with wild animals for some 60 years, and in 1977 she opened the elephant orphanage at her home in Nairobi. There her trained staff of eight virtually replaces the baby elephants' families. So far the orphanage, which survives on charitable donations, has saved 12 infants.

"Stressed baby elephants are very fragile," Sheldrick explains. "Often they have witnessed the death of their families at the hands of ivory poachers or irate farmers whose crops have been trampled. The baby elephants are so devastated with grief that some die of a broken heart."

As for Zoe, she was basically healthy, and once under Sheldrick's care she thrived, consuming six gallons of vitamin-laced formula a day and earning a reputation as a confident, naughty and mischievous youngster. Recently, after a year in the orphanage with the constant companionship of her human family, Zoe was weaned and taken to a refuge at Tsavo National Park. There her favorite keepers will gradually introduce her to the ways of the wild, helping her to find food and water. Nights are spent with other elephant youngsters in a protected stockade. It may take some years, but the ultimate aim—as with all the orphans—is to release her to a wild herd.

Sheldrick's dream for the future is to see "ivory remain banned, all stockpiles destroyed and no one to ever wear an ivory trinket." There will always be competition for land, Sheldrick explains, but we can "protect elephants in the parks and give the young a chance."
Marlane Liddell

Photographs by Jim Leachman

Right: Sungelai, rescued from a mudhole at 2 weeks old, takes a break with Josphat Saya. Sadly, Sungelai later died of a congenital heart defect.

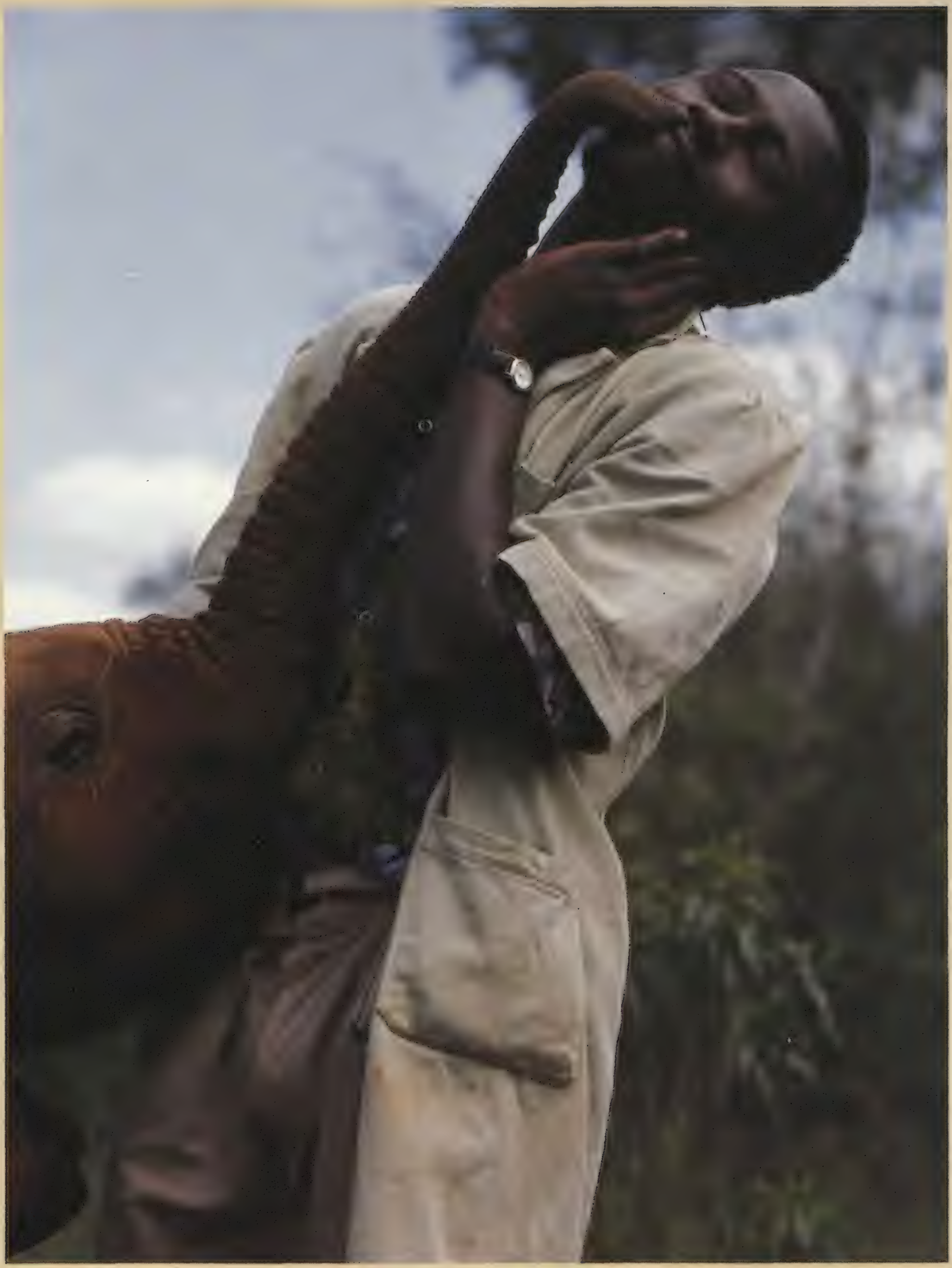
Elephants are very social and playful, and like any other youngster, Zoe loves to roll in the grass. Saya, one of her keepers, watches in delight.

Baby elephants are susceptible to pneumonia; to keep them warm in the chilly morning air, their keepers cover them with blankets and build a fire.

Saya beds down with Zoe in the stable to help her feel secure; the devoted keepers are with charges 24 hours a day in their role as substitute moms.

After wallowing in a mud bath for fun, and to protect its skin from sun and insects, an orphan is showered with dust by head keeper Mishak Nzimbi to dry off.

Lominyek, left, who survived a gunshot wound when ivory poachers killed his mother, leads Nzimbi and other foundlings on a walkabout in Nairobi National Park.



Zoe touches her trunk to Atanash Mulei's mouth in an elephant-style display of affection; when one elephant greets another, its trunk is placed in the other's mouth.

By Bruce Watson

'The storyteller is the soybean . . . the audience is the sun'

They need each other to make something good happen, and when they get together at festivals and workshops across the land, it usually does

Imagine a bedtime story once upon a time. A mother, a father or a grandparent begins telling. The child listens wide-eyed as the tale works its wonders. The bed turns into a flying carpet, a jungle floor, a castle. The story builds and broadens, then glides to a close with a lesson and a "good night." Now imagine a bedtime story in the Information Age. The world outside is glutted with TV, computers and video games, yet inside a huge white tent a soothing voice is telling tales to a thousand listeners, each as charmed as any child. A likely story?

On a warm, cloudless weekend last fall, the town of Jonesborough, Tennessee, enjoyed its annual population explosion. Local restaurants put on extra staff. Shuttle buses provided links to every hotel within shouting distance. From all over America, some 8,000 people came to Jonesborough just to hear stories. Overflow crowds listened as a man with an accent as thick as pine tar recounted his Appalachian boyhood. Kids sat for an hour while a woman in a flowered robe told how the animals got their tails. There were ghost stories at night and sacred stories on Sunday morning, family stories in one tent, tall tales in another.

Jonesborough is the seat of a storytelling renaissance that has spread to every corner of the land. From the suburbs of Southern California to the woods of New Hampshire, more than 225 storytelling organizations will host festivals this year. The Great Plains Storytelling Championship will be held this September in Walnut, Iowa. A ghost story festival is set for October in Battle Ground, Indiana. There's a Hanukkah Storytelling Festival in Brookline, Massachusetts. And the National Association of Black Storytellers, based in Baltimore, puts on its festival in a different city each year. Every Saturday morning all summer, Diane Wolkstein will tell stories, as she has for nearly three decades, at the statue of Hans Christian Andersen in the wilds of New York City's Central Park. In all, as many as 500 storytellers are making a living telling tales in schools, churches, libraries, parks, hospitals, even management-training courses.

To listen to tellers tell it, stories nurture those who take time to listen. "We're all storytellers," says Jimmy Neil Smith, executive director of the National Story-

In her patchwork skirt and bright red hat, Kathryn Windham charms the crowd with tales of the supernatural.

telling Association (NSA), which will hold its 25th-anniversary festival in Jonesborough this year. "We all live in a network of stories. There isn't a stronger connection between people than storytelling."

The first stories were told before the first antelope were painted on cave walls. The first written literature grew from oral stories, as did great epic poems and scriptures. Radio served as one of our principal storytellers until the advent of television. Once TV arrived, however, words weren't good enough anymore. We needed lights, camera, action. TV told plenty of stories, all right, but it left little to the imagination. Eager for stories that can be seen on a mental screen, people are returning to the word. The revival began in the hills of Appalachia, where storytelling never really died out.

Jonesborough, Tennessee's oldest town, is itself a storybook place, filled with antebellum homes, quaint front porches and a Main Street that takes you back some. By the late 1960s, however, its downtown district was dying. To revive their ebbing fortunes, merchants put on festivals to call attention to the community's heritage. In 1973, they invited some local blabbermouths, who pulled an old wagon into the courthouse square to use as a podium for telling stories. About 60 people

Photographs by Tom Raymond

During the Jonesborough festival's official dinner break, "unofficial" storytellers keep a crowd enthralled in Courthouse Square. This ad hoc get-together is not sanctioned but has become popular over the years.

came. The following year, they did it again. In 1975, the forerunner of the NSA was formed. By 1980, the festival was drawing 1,000 listeners. A few years later, it had grown to 5,000. And the word continued to spread. Seemed there was more to those stories than just living happily ever after.

Stories are found in every subculture in the country, making Jonesborough's festival a smorgasbord of accents. Last October, as I wandered from tent to tent, I heard America talking. Stories came alive in the cadences of Cajun, the fast-lane lingo of California, the gentle ramble of the Midwest, the twang of Texas. In the Railroad Tent down by the tracks, Donald Davis enthralled the crowd with stories of old North Carolina. A retired minister who has told stories for most of his life, Davis is one of the nation's most popular tellers, traveling year-round to share his tales. Davis is amazed at how he makes a living. "In my family, stories were natural conversation. When I was invited to my first festival, I didn't get it. I asked, 'What's a storytelling festival?'"

Beneath the huge canopy, Davis had 1,500 people hanging on his every word. A master of timing, he measured some sentences drop by drop, poured others out like water from a pitcher. The story was about his first day at school, and the crowd laughed at Old Miss Lois, "a teacher specially built by the school board so she would neh-verrrr blow away." They squirmed as he squirmed, dying to go to the bathroom, then going without leaving his seat. Pulling myself away from Davis' stories, I sampled another culture in the Creekside Tent. There, in a pleasant drawl, Kathryn Windham told stories of Jeffrey, the ghost who shares her house in Selma, Alabama. "We're not afraid of Jeffrey," she said. "It's like having an excuse. We blame everything that's gone wrong in the house on Jeffrey. He's one of the most convenient things that ever happened to us." Later, Windham told me she is still surprised to be in the spotlight telling stories to so many people. But onstage, grandmotherly in her patchwork skirt and bright red hat, she spoke as if the audience were on her back porch.

Jonesborough's festival has the camaraderie of a summer camp. Friends greet each other outside the tents. Strangers tell their own tales at the Swappin' Ground. And audiences listen and laugh, knowing that they

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have shared the same embarrassments and triumphs.

Some stories seem to be made out of whole cloth. Others are like the Tennessee quilts on sale in Jonesborough's many craft shops. They weave together past, present, fact and fiction in a tight design both dazzling and unforgettable. One such tale was unfurled during Sunday morning's program of sacred stories in the Railroad Tent. North Carolina teller Joyce Grear recalled being a proud sixth-grader participating for the third consecutive year in the school's Easter play. Dressed in her finest, she was to be the angel in the story of Christ's resurrection. Her role was simple enough, she told the crowd. She had to come out onstage, sit down on the rock that had been rolled back from the tomb, and announce, "Have no fear! He is risen!" Exit.

Although you wouldn't know it to see Joyce Grear tell stories today, strutting the stage in a flowered robe, she was once very shy. Class recitals and plays helped build her confidence. When she became an English teacher, she used storytelling to help kids appreciate literature. "I found I could hold the kids' attention when I prefaced any lesson with a story of a similar theme," she told me. "This storytelling just kind of rippled out of me."

As her Easter tale unfolded, Grear became every child nervously practicing for a play. "Have no fear! He is risen!" she repeated to herself backstage. "Have no fear! He is risen!" Finally Grear stepped onstage, proud, confident, 11 years old. But her teacher had forgotten to make sure the rock was positioned correctly. When Joyce sat down, she fell onto the floor with a crash.

The entire audience, dressed in their Easter best, roared with laughter. Even Grear's parents were laughing. But the little girl rose to the occasion. Getting up off the stage floor, holding one finger aloft, she pronounced: "Have no fear! He is risen!" And like the audience in the story, the delighted Jonesborough crowd roared with laughter.

Then Grear turned comedy into wisdom. She spent months hating her teacher, she said. "She should have set that rock up correctly." But eventually, a spirit stirred within her. Passing her teacher on the street one day, the girl, now 12, closed the door on her hurt and uttered good-naturedly, "Have no fear! He is risen!" "Yes he is," replied the teacher, "yes he is." When Grear left the stage, the audience rose in a standing ovation.

Many festival stories are traditional. At Jonesborough and elsewhere, you can hear tales by the Brothers Grimm, or yarns about Brer Rabbit or Paul Bunyan. These old stories hold up surprisingly well, but some tellers update them for modern audiences. Across the Jonesborough grounds, in the Tent on the Hill, David Novak took a simple children's song and turned it into "The Itsy Bitsy Spider's Heroic Climb," a 20-minute saga filled with pathos and hope. Novak's story, set in Spidertown, told of the Bitsy family. Mr. Bitsy ran a construction business. But his son didn't want to follow in his father's footsteps. Itsy Bitsy was a dreamer. So one day he set out to climb . . . the waterspout! His mother made him a delicious lunch, Novak said. "A fly sandwich!" Children throughout the audience groaned. "Grasshopper chips!" Uuuugh! "And freshly squeezed moth juice!" More groans. "Hey," Novak countered, "it's 100 percent natural." With lunch packed, Itsy set out to climb, leg over leg over leg over leg . . . higher. Higher.

Teenage storytellers Jennifer Carter, left, and Erin Hensley swap material in front of an old log cabin on the festival grounds. Carter likes tales with surprise endings; Hensley prefers Appalachian stories.

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Novak, a gifted teller who regularly performs at festivals around the country, enhances his stories with a bag of tricks. His fluid voice can become a dozen different characters. He sometimes takes out a looped string and turns cat's cradle tangles into antlers, beards and other costumes for his protagonists.

Itsy's heroic climb took an ominous turn. "The day grew dark as shadows drifted across the land below," Novak said. "In the sky above, huge thunderclouds were forming, swelling up like great gray sponges full of water ready to drench the world. For a great storm was coming. The winds started to blow. Itsy Bitsy held on for as long as he could until DOWN CAME THE RAIN AND WASHED THAT SPIDER OUUUUUUUTTTTT."

But even though he was a spider, Itsy had a hero's heart. As if the story were a Greek saga instead of a children's rhyme, Novak told how Itsy overcame his tragedy and went up the spout again, leaving the audience to sing the rhyme one more time with the teller.

You don't have to go to a festival to hear stories. Like the fabled griots of West Africa, who are responsible for preserving their culture through stories, hired storytellers are now telling tales at weddings and bar mitzvahs, at academic conferences and elder hostels, in hospitals and museums. Not long ago, at a bucolic retreat surrounded by the wetlands of coastal New Jersey, Michael Cotter stepped before the toughest audience of his life. It was made up of more than 20 boys, men, middle-aged women and senior citizens who were suffering from AIDS and various cancers. They had come to Cotter's storytelling workshop to tell their own stories, reaffirming life in the face of death. Standing before them, Cotter started out with his own definition of the art. "Storytelling," he said, "is where we share what we've discovered, and all of us have discovered a little secret about life."

A third-generation farmer, Cotter was 49 before he knew he had a tale to tell. Attending a workshop in St. Paul, Minnesota, one day, he realized how stories had shaped him. "During the Depression, my father used to hire drifters to work on the farm," Cotter told me in his slow, easy speech. "And I'd sit around and listen to their stories. We didn't call it storytelling. It was just entertainment, what people did before electricity." After telling a few family stories to informal groups, Cotter decided to try it onstage. "I just stepped up and told everyone I was a storyteller," he remembered. "And they all sat there waiting. That's what it takes, someone who tells you you're worth listening to." At 65, Cotter still runs an 850-acre farm in southern Minnesota with his family. On weekends, he tells tales at festivals and on his radio show in Des Moines. But here at the Jersey shore, he had come to help others tell their own stories.

Moving around the room, he urged each patient to tell a story about his or her name. Shyly at first, then with pride, the new tellers shared silly stories of parents, siblings and nicknames. Soon the tales deepened, touching on illness and hope. The telling continued all day. "When people who are sick or dying share their stories, their lives are validated," Cotter said. He ended the workshop by passing out soybean seeds from his farm. "The storyteller is the soybean, but the audience is the sun," he noted. "They have to get together."

Much of the oral movement's appeal comes from its democracy. At Jonesborough, the tents are reserved for the pros, but at the Swappin' Ground anyone can tell a tale for ten minutes, just for the fun of it. The audience sits on bales of hay, and one by one, story swappers take the stage. Jim Ribby, a parole and probation officer from Rapid City, Michigan, recites "The Cremation of Sam McGee," one of more than a hundred poems he performs from memory. Following Ribby, a Kentucky schoolteacher uses a flannel board to tell a Bible story. A California computer salesman tells a tall tale. A Baltimore teacher shares a sports story from the 1929 World Series. And the swappin' goes on, through a West African folktale to a Jewish story and on around the world.

Something happens to these people when a simple story takes hold of them. As the tale grows, the most reserved person comes alive. Shyness disappears. Voices emerge as if the teller were speaking in tongues. When the telling is just right, the audience is swept away.

On a chilly New England evening a few years back, students at prestigious Amherst College set aside their studies to sit by a fireplace with their dean of students and listen to her tell stories. Jean Moss had made no secret of her budding interest in becoming a storyteller. After raising two sons and a daughter as a single mother,

Author Bruce Watson, who has written about Coney Island and the Gibson guitar, says he knows how important storytelling is now that he has children.

Among the tellers at Jonesborough last year were (clockwise, from top left): Joyce Grear, a former teacher; Donald Davis, a retired minister; Irishman Billy Teare; Len Cabral, a Rhode Islander who shared African fables; Judith Black, who evoked unsung heroes; and Ray Hicks, who told tales from Appalachia.

At Jonesborough's Swappin' Ground, a teller who calls himself Brother Blue puts body English on a story.

she had returned to college to earn a master's degree in education. Along the way, she was enchanted by a local teller and began to wonder if she, too, might have tales to share. Searching for her own story, she thought back to a front porch in Jackson, Tennessee.

"My daddy used to sit on our porch smoking a corncob pipe," Moss told me, punctuating the tale with poignant pauses. "That pipe smoke was lethal. It was compounded by the smoke from rags we burned to keep the mosquitoes away. My daddy's skin was the color of rich, brown tobacco leaves. His face was somber most of the time, but a twinkle came in his eye when children climbed in his lap. He'd light up his pipe and point to the sky. He'd say, 'See that white streak up there. That's milk!' One of us would say, 'That's milk?' 'Uh huh. Wan' know how it got up there?' And by the time he finished, we'd splashed through the Milky Way, been terrified by the Big Bear, gone hunting with Orion and cuddled the Little Bear."

When the Amherst students asked her to tell them some stories, the dean proved to be a natural. Her love stories, creation stories and fables so enthralled her audience that they sat motionless when she finished and asked for more. Moss was further encouraged when a mentor gave her the Yoruba name Onawumi, which means "one who loves creativity." She began telling stories at local festivals and, before long, was invited to Jonesborough as one of six regional tellers from around the country. In her rich, robust voice, she recounted "The Day Destiny Called a Parent/Teacher Meeting at the A&P Grocery Store." The true tale, in which her mother and teacher talk at the grocery store about Jean's boredom in class, drew a standing ovation.

Everyone may have a story to tell, but why are so many people listening?

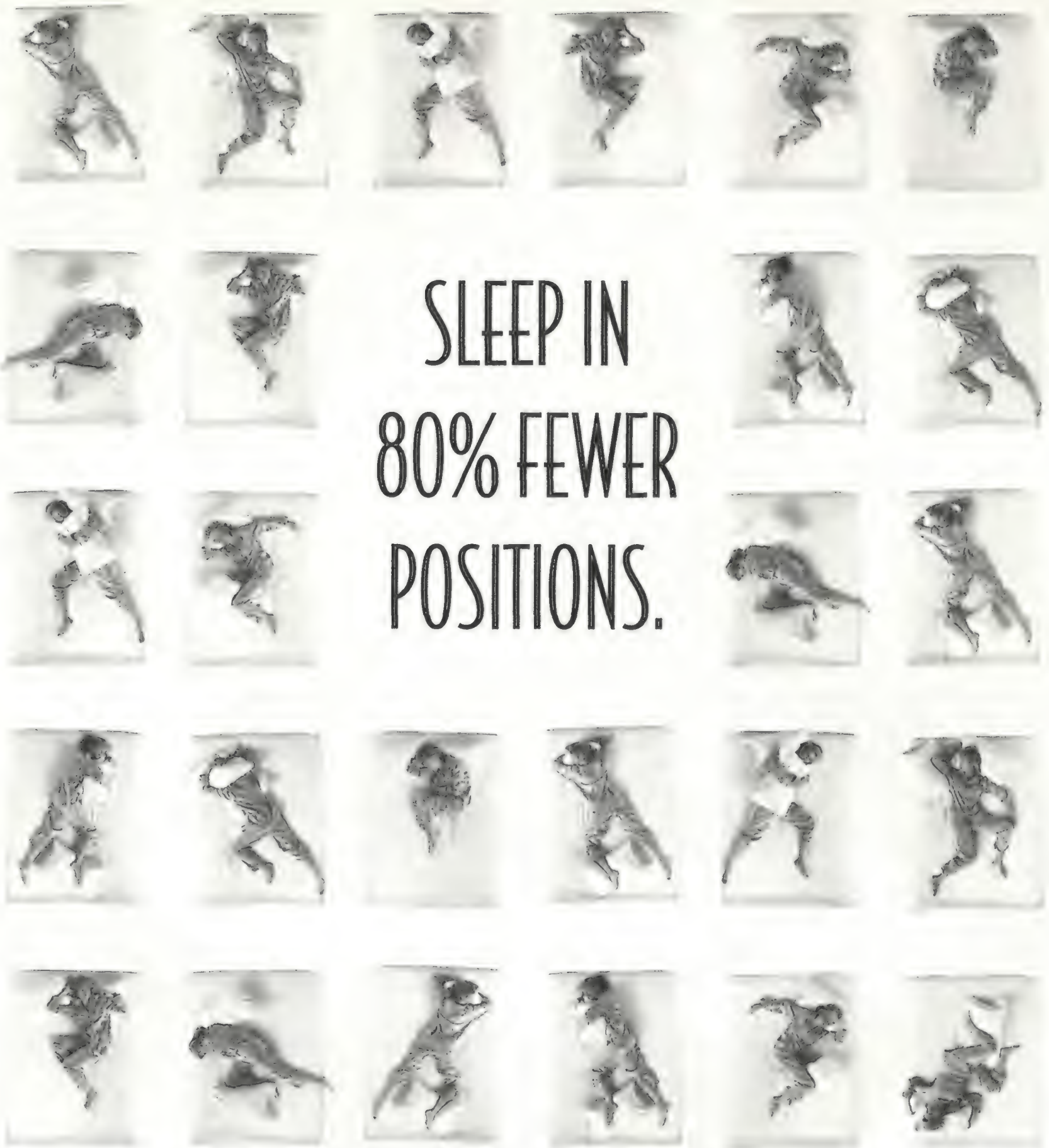
Psychologists say that stories tap the brain's memory structures. In his book *Tell Me a Story,* the artificial intelligence pioneer Roger C. Schank explains: "Human memory is story-based. . . . Not every experience makes a good story, but, if it does, the experience will be easier to remember." One part of human memory breaks down experience into facts, Schank writes. From a day's events, the mind retains phone numbers, directions, the next day's errands. But another part of memory—Schank calls it "episodic memory"—assembles experience into stories. And because stories contain philosophy, lessons and principles, they are remembered long after facts fade. Ours is a world of stories, Schank continues: "We know them, find them, reconsider them, manipulate them, use them to understand the world and to operate in the world, adapt them to new purposes, tell them in new ways, and we invent them. . . . Our ability to utilize these stories in novel ways is a hallmark of what we consider to be intelligence."

But if everyone loves stories, can we love them too much? Some storytellers worry that the art is becoming too popular for its own good. "It's changed with all the microphones and lights," Kathryn Windham told me. "Storytelling should be the most personal of all arts. It distresses me when I see storytellers becoming performers." At Jonesborough, many tellers have tapes, books and videos for sale. Meanwhile, the NSA is taking storytelling into the 21st century. It has its own site on the Worldwide Web, and it hopes to have finished a $10 million National Storytelling Center in Jonesborough by 1999. The center will feature a three-acre park, an interpretation center and a huge story archive.

Jack's adventures in Appalachia

Those who worry about commercialization would do well to listen to Ray Hicks. Raised in the hollows near Beech Mountain, North Carolina, he is a born storyteller. Like his father and grandfather before him, he tells Appalachian tales about the wild adventures of a mountain boy, Jack. The original Jack story has to do with a beanstalk, but when Hicks took the stage at Jonesborough, no one knew where this Jack would end up.

For 90 minutes, Hicks told tale after tale. He seemed as thrilled as a child by his own stories. "Waylll, Jahahk," Hicks intoned. "His muh-ther called him to her side one day. An' she say-ud, 'If hit don' rain, all the co'n, pun'kins, and feed'll jus' burn up.' Jack says,



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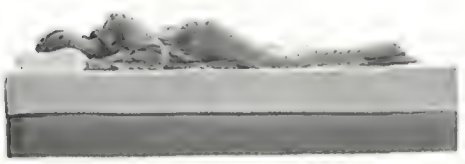

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'Mahm, I b'lieve if you lemme go, I'd meet someun'd give us sump'in tuh go 'pon.' Waylll, directly, Jack's muh-ther say-ud . . ." Hicks tells more than mere stories. Though his accent is so strong it is often hard to decipher, his voice contains an entire culture. His rich baritone tells of hard times and high times, the wonder of survival and the certainty of doom. "You tell stories with that harmony in ya," Hicks said. "Like tunin' a motor, you can hear when it hain't runnin' right." And seated before a full house, Hicks let his stories run. He chuckled at his own jokes, rocked back and forth with hands on knees, and let his tales engulf the audience.

Many tellers end their stories with something like an incantation: "Story, story, make it yours and pass it on." And the movement, begun by adults, is being passed on to a younger generation. Erin Hensley began telling in the fourth grade after her teacher earned a master's degree in the art at East Tennessee State University. Hensley, 14, now tells in schools, libraries and festivals near her native Chuckey, Tennessee. Her friend Jennifer Carter, 15, lives on the other side of the Appalachian Mountains. She began telling tales in the footsteps of her mother, who heads the Blue Ridge Mountain Storytelling Association. Despite their different styles—Hensley likes to tell Appalachian tales, Carter favors stories with surprise endings—the girls agree that storytelling is pretty cool.

"A lot of kids at my high school think storytellers are nerds," Hensley said. "If I start telling one of my stories, they roll their eyes and say, 'Oh no.'" But convincing the most skeptical listener just takes time, timing and a good tale. "Some people think storytelling is just for little kids," Carter said. "They think they've outgrown it—but you never do."

After dark, performers in an illuminated gazebo at a Jonesborough park titillate the audience with ghostly adventures. Storytelling itself has become a big story. More than 225 festivals will celebrate the art this year.

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By Richard Wolkomir

Unearthing secrets locked deep inside each fistful of soil

To scientists at the National Soil Tilth Lab in Ames, Iowa, it's not just dirt they are probing—it's the planet's sustaining surface

"These are *young* soils," says Jerry Hatfield, happily squinting across an Iowa soybean field. It is soybeans to the horizon, under a fierce July sun. Hatfield heads the National Soil Tilth Laboratory, in nearby Ames, where scientists probe the dirt under our feet, hoping to keep us supplied with the makings of instant mashed potatoes and microwavable beef Stroganoff. But Hatfield's dark shock of windblown hair makes him look, right now, like a schoolboy playing hooky.

His lab deconstructs soil with gas chromatographs and mass spectrometers, magnifies it under electron microscopes, pelts it with synthetic rain and even hauls multiple chunks of cornfield indoors to study. But to see the real stuff—richly black, and lots of it—Hatfield sometimes sneaks off to these ruler-straight country roads. Today he is checking on sensing stations that monitor the chemical flux down where the soybean roots twine. "This soil was put down by the last glacier, so it's only about 10,000 years old," he observes.

His U.S. Department of Agriculture laboratory is also relatively young. It opened in 1989 to study soil quality, or "tilth." The goal is to help keep humanity fed, as ever more of us try to subsist on ever less arable land. It studies soil as an ecological system—a system that includes humans. And so, as Hatfield surveys this field, he sees more than soybeans.

For one thing, he can look back through time, to the end of the Pleistocene, when melting glaciers deposited this magically fertile soil. He also can envision the early 1800s, before Europeans reached Iowa with moldboard plows. Then this landscape was a tall-grass prairie, checkerboarded with ponds and cattail marshes. Mosquito clouds swirled. Bison grazed. Snow geese, gadwalls, pintails and blue-winged teal cacophonously honked and quacked.

To convert the sopping prairies into cornfields, settlers buried tile drains. Farmers have been extending the drains ever since, on into today's era of perforated polyvinyl pipe. Water that otherwise would pool in every low spot now gurgles through subterranean conduits. "There it is," exclaims Hatfield, lifting a manhole cover at the dirt road's edge. Below, water gushes from tributary pipes into a larger artery, and then rushes away into the underground darkness. Ultimately, this area's drains empty into Walnut Creek. Hatfield's lab is keeping the entire 13,000-acre watershed under surveillance.

"There's one of our monitoring stations," he says, pointing to a white box on a post. "You can see the solar cell that keeps the battery charged." This station keeps its electronic finger on the subterranean flow's pulse. A Soil Tilth Laboratory researcher regularly drives these roads, stopping at each station to plug in a laptop computer and download data on such variables as water temperature and rainfall amount. The researcher also collects water samples, to analyze how much of the adjacent field's fertilizers and herbicides are leaching into the groundwater.

To the researchers, this soybean field is a biological system, like a beaver pond, or a Pacific kelp forest where

In a simulated-rainfall chamber, entomologist Ed Berry (opposite) checks worm colonies; the creatures are vital to soil formation, a focus of research at Ames lab.

Photographs by Regis Lefebure

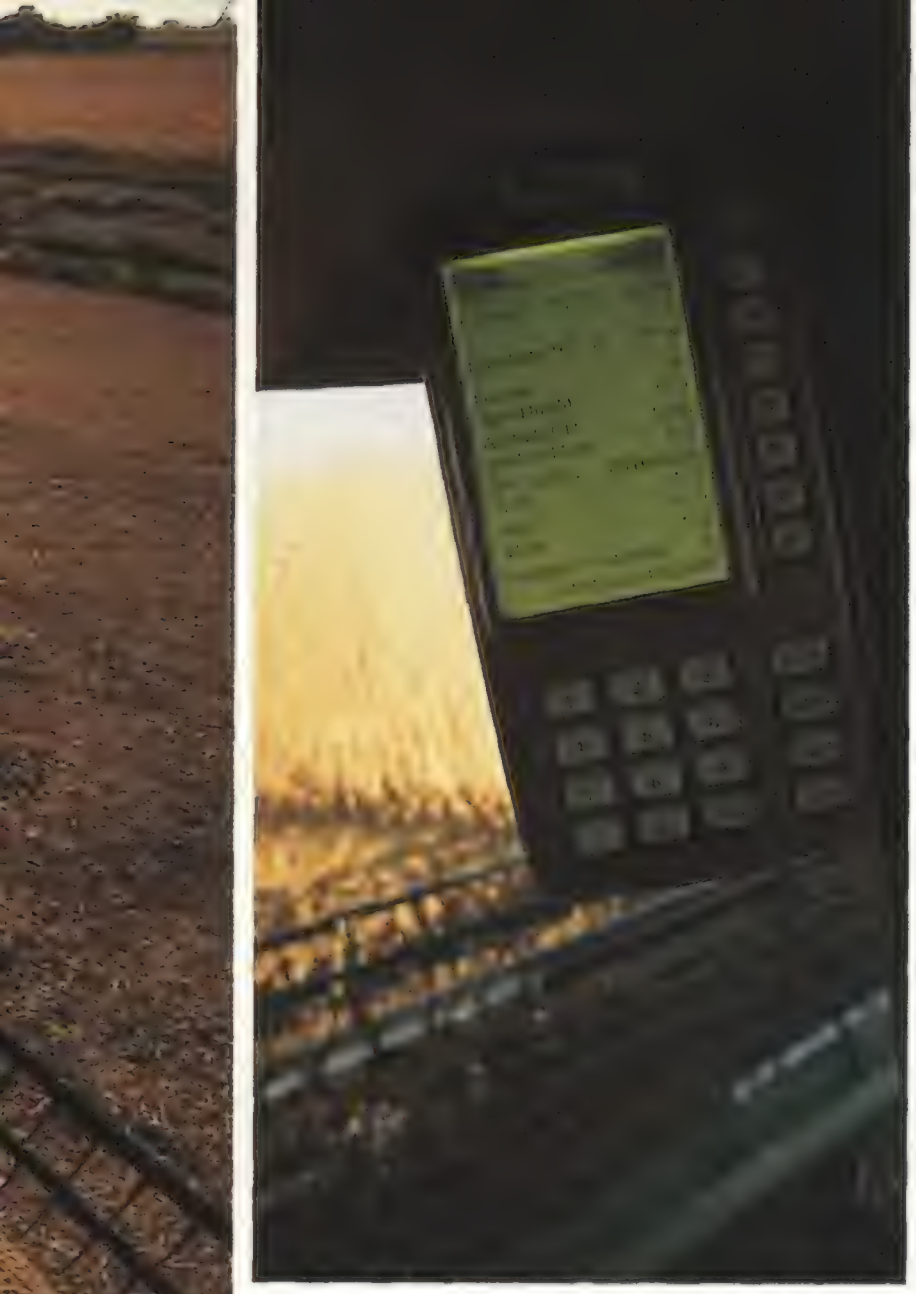
National Soil Tilth Lab
Raindrop tower

sea otters rein in sea urchins. But this particular ecosystem is synthetic: the keystone species is the Iowa farmer. Like prairie dogs, farmers churn the soil. And like bats dropping guano, and like beetles dying in the dirt, farmers lace the soils with chemicals. "We look at soil as an ecosystem that includes the farmer," says Hatfield, and he embodies the approach. He grew up on an eastern Kansas farm that raised wheat, sorghum, alfalfa, cattle and hogs. He has degrees in agronomy and crop physiology. "I look at how soil and plants interact with each other, and with the atmosphere," he adds. The laboratory, too, views soil from multiple angles.

Geology, for instance: Hatfield says soil begins as bits of mineral pried from rock by water and wind. Of the three types of inorganic grits making up soil, the smallest and most chemically active are clays, made of various minerals. Clay particles are powderlike, no more than 2 microns across. One notch up in size are the silts, also composed of various minerals, but 2-20 microns across. Sands, the largest particles, are mostly quartz. They measure 20-53 microns. These clays, silts and sands, mixed in various proportions, cover most of the continents. In some spots the soil can be two stories deep, or more. But usually it is shallower. Often it is not even knee-deep. "That thin skin supports all human life, and all terrestrial animals and plants," notes Hatfield. "So we can't just conserve it—we have to make it better."

Agronomists sometimes treat soil simply as a crop-growing medium. But the laboratory's 21 scientists and 6 research associates take a different approach: they study soil as an ecosystem, where everything interacts, from bacteria, fungi and millipedes to farmers driving John Deeres and International Harvesters. Some of the lab's researchers study soil by the acre. Others look at what goes on in mere specks.

Back at the laboratory, a glass-and-brick tower on the Iowa State University campus, soil ecologist Cynthia Cambardella produces a scanning-electron microphotograph of what looks like magnified dandruff. "This is a former piece of plant, clearly a bit of root, that's on its



Farmer Tom Uthe, left, and scientist Dan Jaynes consult a computer-generated yield map, based on satellite positioning via the yellow antenna and sensor-readings of crops being harvested. Data are shown on a monitor (above) in the combine's cab.

way to becoming organic matter," she says. Soil is chockablock with living things and formerly living things, like the bits of decomposing root in Cambardella's photograph. In science lingo, such specks are "particulate organic matter," or POM.

Cambardella produces another photograph from a scanning-electron microscope, this one showing soil enlarged 1,000 times. It looks like a bunch of lumpy grapes. Actually, it is specks of organic matter—including POM—glued to specks of mineral. Cambardella calls such an assemblage an "aggregate." Aggregates join to form even larger aggregates. Millions of microbes teem in the larger interstices where the aggregates are glued together. "I've spent years trying to define that glue," she reports. "I now think it's mucuslike substances secreted by the organisms as they transform bits of root into POM."

Actually, says Cambardella, the tiniest bits are held together by chemical forces. The biggest clumps are bound by roots and fungi strands. It is the midsized aggregates that microbe secretions glue together. Stored in those secretions, she believes, are nutrients that make crops grow. She hopes agronomists eventually exploit that discovery by learning to split open soil aggregates precisely when crops need the nutrients.

"When you plow soil, you crack open the aggregates and release the stored materials, and it may be that they're not needed then—that is what happened when settlers plowed the prairies," she explains. Spring seedlings can't use this nutrient burst; more mature plants can. Prairie plants were mostly underground tangles of roots, enabling the plants to survive scorching fires and then quickly regrow. All those roots eventually decayed, enriching the soil. "Since the 1860s, we've lost more than 40 percent of the soil's nutrients," Cambardella says. "We rip apart the native plant culture and replace it with an alien single-crop monoculture of soybeans or corn—agriculture is a violent activity."

In fact, modern agriculture has researchers worried. For one thing, higher doses of fertilizer and herbicides no longer seem to automatically generate higher yields. Meanwhile, agricultural chemicals are showing up as pollutants in the water table. The Soil Tilth Laboratory is working on these problems.

"My background is in nonagricultural ecology," says Cambardella. "I try to look at natural systems as a baseline, and ask, 'How did nature solve this problem?'" For instance, nitrates in the root zone leach away into the groundwater. But in native prairie ecosystems, the soil's microbe population is synchronized with the plants, releasing nitrates into the soil just as the plants are ready to take them up. Nitrates do not build up in the soil, and leaching is minimal. "If we can figure out how that works in the natural ecosystem, maybe we can apply it to the agricultural ecosystem," Cambardella says.

Currently she is mesmerized by POM, those specks of decomposing organic matter. POM, she believes, gives topsoil its biological fizz. "It's probably the single most important component for the sustainability of soils."

So how does a dead corn leaf, POM-to-be, lying inert in a furrow, get reduced to pieces the size of saltshaker crystals and make its way underground where it can actually do some good? Another researcher at the laboratory, entomologist Ed Berry, is studying one of nature's answers to that very problem—worms (SMITHSONIAN, July 1993).

"We've set up camcorders to spy on worms and see what foods they choose," says Berry, starting a videotape. A worm, looking on the screen like a horror-film monster, is stretching out from its tunnel along the surface of the ground. "A worm's mouth is a suction de-

Frequent contributor Richard Wolkomir also writes as a team with his wife, Joyce. Their most recent article profiled the Center for Nonproliferation Studies.

Wearing night-vision goggles, Doug Buhler tills a field; reduced light exposure may retard weed germination.

vice," says Berry. On the screen, the worm latches onto a dead leaf, finding it by smell and feel. The worm backs into its hole and disappears, pulling the leaf down after it. "We can digitize that and get the actual size of the material the worm is taking under."

Studying worms, he explains, has become especially important since the rise of "no-till" farming. Farmers using this technique do not plow their soil, because that bares it to erosive winds and rains. Instead, they use a machine that slits open the earth, drops in seeds, then closes the slit. Dead leaves and stalks from last year's harvest remain atop the ground.

Such debris contains carbon and nitrogen that could enrich soil. But, as long as the debris lies aboveground, its nutrients are locked up. Another disadvantage of no-till is that unburied debris keeps the ground cooler and wetter in spring, which hampers planting and germination. And not plowing can stratify nutrients, which could be a problem. But the soil ecosystem can fix itself. As Berry puts it: "Worms are free farm help." Worms, like the night crawler on Berry's videotape, pull fallen leaves and stalks underground, and break them into smaller pieces. Mites and nematodes then make them even smaller, and fungi and bacteria make them smaller yet, until eventually they reach POM size. Meanwhile, earthworm burrows, sometimes going down 25 feet, allow rain and oxygen to percolate through the soil.

Downstairs, in a lab dubbed "the cave," in soil-filled plastic boxes, Berry raises nine species of worms for study. One of Berry's projects is to help farmers in Missouri, who must contend with topsoil only four or five inches deep over an impermeable claypan. Berry hopes to find a worm that will thrive in Missouri clay, its burrows creating pathways for moisture and roots. "So maybe we'll use these night crawlers—they're like deer, seeming to thrive everywhere," he remarks, scooping up a writhing handful. But then he peers into another container, which is alive with smaller worms moving as rapidly as snakes. "Their scientific name is *pheretima*," Berry says. "They're indigenous down there in Missouri, so maybe we can get them to do the job."

His worms also are helping to determine what happens to soil quality when farmers let eroded fields lie fallow for up to ten years. Do the earthworm populations increase? Do the species change? Berry opens doors to a growth chamber, where conditions such as temperature and humidity are just the way worms like them. Inside, another set of worms squirms in plastic boxes. They are a study in population dynamics: Can a field be too wormy? "Will the worms clump up all the plant residues into little bitty piles and leave lots of bare spaces?" Berry asks.

Even dead worms pickled in bottles are doing their bit. They are samples of worm populations from various types of farms, ranging from a traditional plowed farm

A weed ecologist, Buhler collects seeds of common botanical pests, foxtail and pigweed, from field of ripe soybeans. As scientists learn to outwit weeds, they can develop methods for lessening the use of herbicides.

to a farm that has been no-till for 17 years. "You can see that the farm with the most worms is the 17-year no-till, followed by the 3-year no-till," Berry observes. By contrast, the bottle from the plowed farm contains a pathetically small heap of worms. One reason is that plowed-under plant residues break down too fast, short-changing worms on food. (For this reason, among others, many researchers see no-till as a more sustainable practice: debris from previous harvests eventually break down into the soil.) Also, tilling dries the soil's top layers, driving worms away. Tilling also turns juveniles out on the surface, where they cook in the heat and sear in ultraviolet radiation. And tilling breaks up a worm's burrows. "After a while, that worm is just going to say to hell with it," says Berry.

One of his more intense studies is of worm microlandscaping. As worms tunnel, they cast out wastes, which appear on the surface as clumps at burrow entrances. These clumps, or casts, can be an inch high. Fungi grow in them, and the casts harden. Berry is trying to determine the impact of a fieldful of such casts. For instance, does the cast's slanted surface concentrate rainwater runoff, causing erosive gullying? And what happens when these glued-together piles of worm excrement, fungi and plant bits freeze? Do they keep snowmelt out of the burrows?

To answer such questions, Berry scans fields with lasers to measure worm casts. And at the lab he puts chunks of soil containing worm casts in the "rainfall chamber." It is a multistory shaft with a gear at the top for generating artificial raindrops of various sizes. The worm samples sit at the bottom. Ersatz rain falls. Afterward, Berry checks the results, one more dab of data to add to his gradually focusing portrait of worminess.

Meanwhile, another researcher, microbiologist Tom Moorman, studies the soil microbes that Ed Berry thinks worms may eat. Moorman analyzes data from the Walnut Creek Watershed soil samples to see how soil microbes break down herbicides, such as atrazine. He has found that in the soil's topmost layer, the herbicide is half gone in just 56 days. But five feet down, the chemical's half-life is 1,250 days. The reason the herbicide disappears so rapidly near the surface is that the soil's top layer is a teeming microbe megacity. The deeper layer is more

Scientist Tom Kaspar surveys soil blocks subjected to simulated winter in a controlled-environment chamber.

like a desert. Moorman counted nearly 123 billion microbes per pound of soil at the surface, compared with just 186 million of the herbicide-eating "bugs" farther down. Moorman aims to reduce herbicide runoff and leaching. Some herbicides may degrade faster, for instance. And he hopes to match microbes to their favorite herbicides, organizing microscopic cleanup crews.

Elsewhere in the lab, weed ecologist Doug Buhler seeks a different solution to the herbicide problem: Instead of spraying herbicides, can farmers deploy weeds to fight weeds? Buhler spreads out a topographical map of a cornfield. The map is dotted blue, red and yellow, showing weed clusters, usually at the bottom of dips. Buhler wants to know why certain weeds seem to prefer low spots. Are dips wetter? Does more organic matter settle there? "Or do seeds just wash off the hills?" he asks.

He is now learning the soil preferences of botanical undesirables, like giant foxtail, velvetleaf, cocklebur and pigweed. He also hopes to identify species that will peacefully coexist with corn or soybeans. Then, along with their crops, farmers could grow the "good" weeds to crowd out the "bad" weeds. "Right now, we're looking at the mustard family," Buhler says.

After dark, he works on a quirkier project: wearing military night-vision goggles, he drives tractors, the headlights off, through Iowa cornfields. "Europeans believe that if you till in the dark, you get fewer weeds, because many seeds need just a flash of light to germinate—maybe a tractor's headlight beams or even the full moon," he explains. He is testing whether night plowing, sans headlights, might cut the need for herbicides.

See-in-the-dark goggles are only one of the lab's gadgets. For instance, it has a tunable diode laser, one of only ten in the United States. Chemists beam the laser through a sample and then analyze the scattering of its light to detect infinitesimal amounts of nitrous oxide or methane. One aim is to see how much nitrogen diffuses into the air from fertilizer. Another is to measure how much methane—a "greenhouse effect" gas—wafts off manured fields.

A soil chunk wired like an intensive care patient

Lab robots tirelessly extract herbicide contaminants from soil samples. First, from a rack of 40 vials, a robot selects a sample to be tested. The robot unscrews the vial's cap, adds a solvent and places the vial on a shaker for mixing, so that the solvent will absorb the soil's contaminants. Then the robot moves the vial to a centrifuge. The vial emerges from the centrifuge with its contents layered, soil on the bottom, solvent on the top. Then the robot places the vial in a pump that sucks out the contaminant-laden solvent. Many mindless steps later, each sample's contaminants are isolated in a vial of their own, ready for a chemist to perform analyses. The robots even replace their own hands when they need smaller fingers for smaller bottles.

But the Soil Tilth Laboratory's pièce de résistance is the Rhizotron, named from the Greek words for "root" and "instrument." Researchers can bring in a three-ton chunk of farmland dug up anywhere in the United States and install it in this facility, which looks a bit like a two-story elevator shaft. Here they subject the sample to years-long experiments, fine-tuning everything from temperature and humidity to precipitation. The soil chunk is wired like an intensive care patient, with readings coming in from the topmost layer, exposed to air and artificial rain, down to the rooty, wormy depths. The Rhizotron even simulates the seasons.

"It's the first week of December in the Rhizotron," says plant physiologist Tom Kaspar. Outside, the July sun is broiling. But Kaspar has opened one of the Rhizotron's access doors and ushered a visitor inside, where the air is wintry. It's a somber scene: gray corn stubble bristles up from the frozen ground, strewn with tan corn leaves and brown cobs. It is getting on toward Christmas in Iowa, under dimming afternoon light. "Pretty soon," he notes, "I'll turn off the lights altogether, to simulate winter when the ground is buried under snow."

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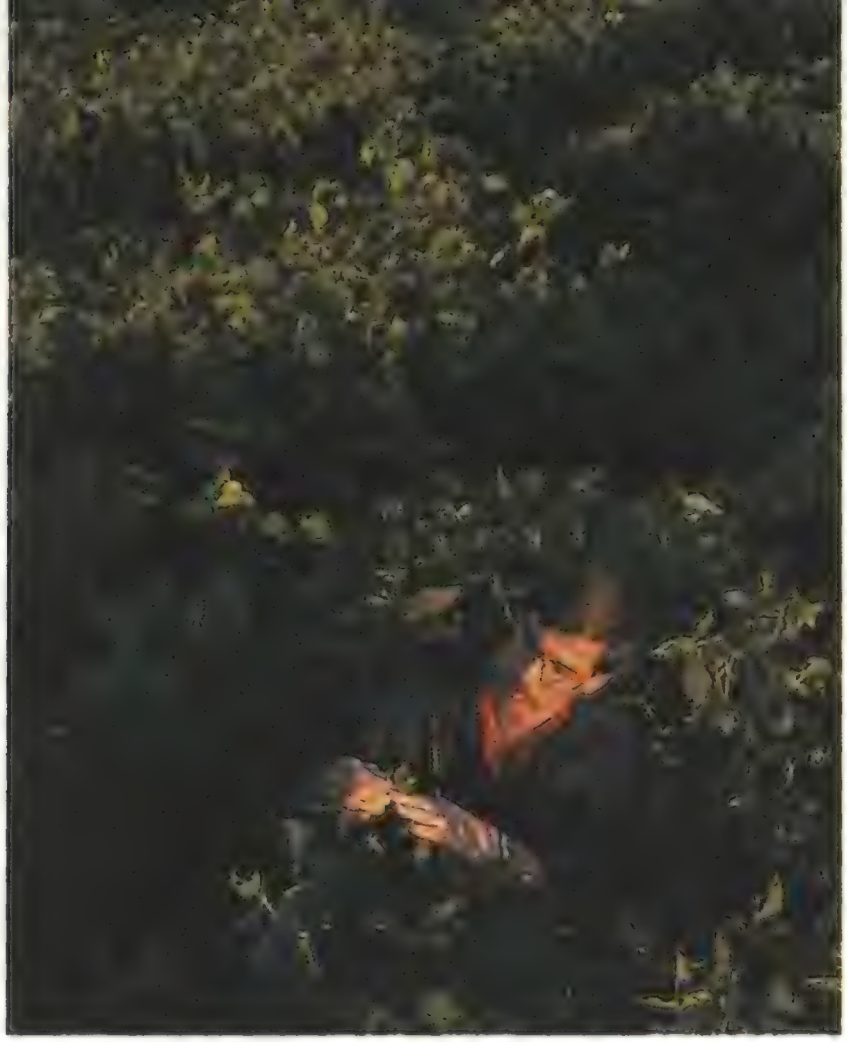

Director of the Ames lab, agronomist Jerry Hatfield examines soybean leaves and pods at a research plot.

In some ways, as a research site, the Rhizotron beats nature. Here, studying crop growth, for instance, scientists can separate the soil's influence from the climate's. In the Rhizotron, scientists maintain the same environment, changing only the parameters they wish to study.

Not all the lab's studies require the Rhizotron. Microbiologist Tim Parkin, for instance, began a research project using mainly his nose. He hopes to develop a smell test for good tilth. "Sniff this," he says, holding up a small vial. Out of the vial wafts essence of potting shed. If you close your eyes, you can see bean vines stretching and cucumbers sprouting. "That's geosmin," Parkin says. "It's an aromatic compound produced by actinomycetes, which are bacteria that grow in long strings."

Soil is a zoo of such microbes. "One teaspoonful of soil may contain up to six billion organisms," says Parkin. A third of a teaspoonful may contain 4,000 species of bacteria. And microscopic fungi can fill that one-third-teaspoonful with more than a half-mile of threadlike filaments or hyphae. These myriad microbes—which have a major impact on soil quality—produce characteristic aromatics, like geosmin. Parkin wondered: Do those aromas reveal which microbes are at work? Does knowing which microbes are active indicate tilth? One way to identify these microbes, Parkin believes, is to learn their characteristic smells. A researcher on the project, Peter Stahl, found a way to analyze soil smells using a gas chromatograph and mass spectrometer.

Parkin began with soils known to grow crops well, such as Midwestern prairie soils. He set out to fingerprint each sample's dominant aromatic compounds. The catalysts of the microbe-producing process are fungi, which begin the job of breaking down dead plant tissues and, thereby, recycling nutrients through the soil. The fungi produce enzymes that degrade the plant's cellulose, releasing sugars that the fungi can absorb. The process releases other substances, too, which attract other microorganisms. "Opportunists come around," says Parkin. As these newcomers feast on the dead plants, they release nutrients like nitrogen, phosphorus and sulfur back into the soil, making them available to the plants. Meanwhile, the microbes release their aromatic compounds. But why remains a mystery.

Maybe, he adds, the aromatic compounds are chemical e-mail, a way of signaling other microbes to start or stop doing something. Parkin's research could lead to a microbe-based agricultural technology: farmers might chemically signal the microbes in their soil to release nutrients, fertilizing crops just when they need it.

It's heady stuff. But lab director Jerry Hatfield still likes to get out on the back roads, to see nontheoretical soil. Right now he has stopped beside a cornfield. He stands at the edge, pointing out how—here and there in the field—the green corn leaves change tints. "That's from soil variation," he explains. "This soil in front of us is Clarion, formed from the till left by glaciers." Soil types often change across a field. "Some parts of a field may even get more rainfall," Hatfield says. He adds that maps of such variations, combined with computers and the developing understanding of what makes soil tick, will usher in "information farming."

"The farmer may tell his computer what weeds he is getting in part of his field, and how many per acre; the computer may tell him that weeds at that population level will not affect profits, so he doesn't need herbicides," observes Hatfield. Eventually, a computer on the farmer's tractor may mete out seeds, or herbicide or fertilizer, to match each square yard's soil and moisture.

But farmers may lose something as they turn to silicon chips and databases. As he squints across the cornfield in the 95-degree heat, Hatfield notes a coming shift in the breeze, detecting it in the direction the corn leaves ripple. "You'll feel it in a second, the moisture," he says. "The corn is sucking up water from the soil and evaporating it to cool its leaves."

The breeze, cool and moist, reaches the road where Hatfield stands. And there is a hint of something else in the breeze: essence of potting shed. Hatfield takes it in. Geosmin, from the rich Clarion soil under his shoes. Good news: filamentous bacteria are on the job.

Equipped with red-gel flashlights, Ed Berry and his son Shane (background) survey night crawler behavior.

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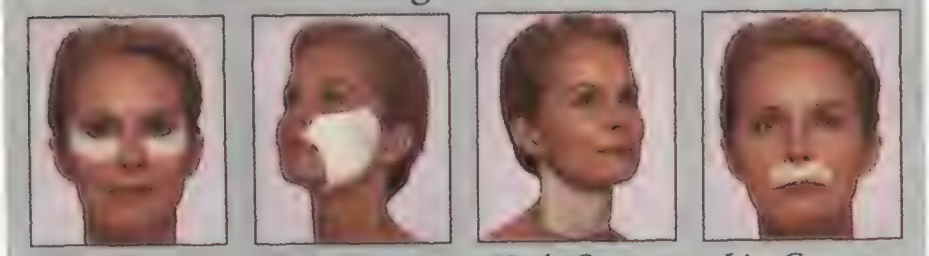

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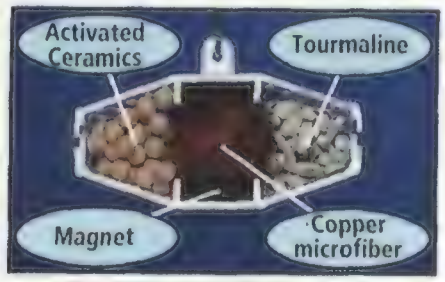

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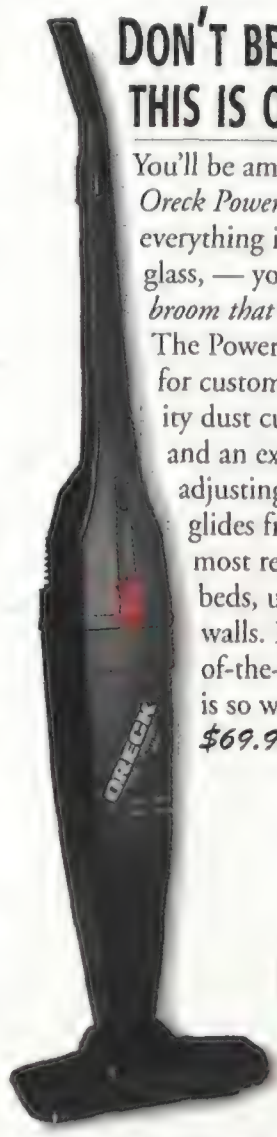

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By Donald Dale Jackson

A stout ship's heartbreaking ordeal by ice

Heading north for the pole, the Jeannette *was frozen fast for 21 months, then sank; for captain and crew, that was the easy part*

It was just after 10 P.M. on the last day of 1880 when Navy lieutenant George Washington De Long rose to speak to the 32 men he commanded on the U.S. Arctic steamship *Jeannette*. They were gathered in the vessel's deckhouse, where the crew had regaled themselves with a homemade minstrel show followed by an earnest rendition of the national anthem. Outside, the temperature in the clear, glistening Arctic night was close to 40 below zero. The ship was 500 miles north of the Siberian coast and going nowhere; it had been locked in the ice pack for an exasperating 16 months. Realistically, there was no longer any chance for the *Jeannette*'s men to achieve their goal of the North Pole. The only question now was whether they would ever make it back home.

The commander surveyed his men's faces, flushed by a holiday dispensation of liquor, and tried to sound a note of cheer. Think of what you've gone through already, he told them. The ship had been squeezed, jammed, tumbled, nipped "until the sides would have burst if they had not been as strong as the hearts within them." They had pumped a leaking hold for a year and held on. More, they were healthy and "as ready to dare

Illustrations by Arthur Shilstone

The expedition commander, Navy lieutenant George De Long, was a natural leader who cared for his men.

as ever." They could still hope, De Long said, that in spite of everything, they might yet "do something worthy of themselves" and of their flag, and then they could return home "and with pardonable pride exclaim that 'I, too, was a member of the American Arctic Expedition of 1879.'" The crowded deckhouse exploded in hurrahs.

The expedition had been De Long's baby from the beginning. As an ambitious young Annapolis graduate he had been seized with North Pole fever while searching the coast of Greenland for survivors of the *Polaris*, an 1871 American try for the pole. He had gained the formidable financial and political backing of *New York Herald* publisher James Gordon Bennett, the wealthy and flamboyant sportsman who had savored his celebrity as the man who sent Stanley to find Livingstone in Africa. Discovery of the pole, a quest that had already lured and killed scores of mariners, seemed tantalizingly close in the 1870s. With the right ship, the right commander, enough money, a little luck—why not? As one newspaper proclaimed, "the solution of the Northern mystery would be the event of the nineteenth century." And in a heroic age, the discoverer would be the hero.

De Long and Bennett proposed to solve the mystery with a new approach. Rather than thrust north from Greenland or Scandinavia, the *Jeannette* would steam through the Bering Strait and hope to find the mysterious warm current that some geographers believed flowed north to the pole above Siberia. Bennett bought a 420-ton, 146-foot-long ship with Arctic experience, reconditioned it and strengthened its bulkheads to withstand ice. The publisher's clout facilitated an unusual partnership with the government: the expedition would sail with Navy officers and under Navy regulations, but its crewmen were merchant seamen and Bennett would pay the bills.

De Long, a well-read and careful man of 35 (in 1879) whose sophisticated veneer overlay a history of scrambling achievement, had specific ideas about his crew. They were to be single, temperate and cheerful; Scandinavians and Germans were preferred—Frenchmen, Spaniards and Italians excluded. Musical talent was a plus. De Long and engineer George Melville, a mechanically gifted, sunny-tempered stalwart, were the only two married men aboard. The two other line officers, Annapolis graduates like De Long, were Charles Chipp and John Danenhower. Dr. James Ambler, a Confederate veteran from Virginia, was the medical officer. Irish-born Jerome Collins signed on as meteorologist and representative of Bennett's *Herald*, while boyish 21-year-old Raymond Newcomb from Salem, Massachusetts, was the expedition's naturalist.

San Francisco gave the *Jeannette* a rousing send-off on July 8, 1879. A crowd on the wharf cheered De Long and his 28-year-old wife, Emma, as they boarded a launch for the short ride to the ship at anchor in the wind-churned bay. Emma, daughter of a retired ship captain, had sailed with De Long around Cape Horn from the Atlantic in the *Jeannette*. Spectators blackened the crest of Telegraph Hill and massed on the waterfront. A 21-gun salute roared from the cannon at Fort Point on the Golden Gate as the ship nosed into the Pacific. At length the escort fleet, bearing well-wishers that a newspaper identified as "senators, congressmen, capitalists and merchants," began peeling off, the last one lingering to ferry Emma back to the city after she kissed her husband goodbye. With that the three-masted bark-rigged *Jeannette*, riding low in the choppy sea with its burden of coal and two years' provisions, turned north.

A few days later, en route to their first coaling stop at Unalaska in the Aleutian Islands, De Long discussed his shipmates in a letter to Emma. Chipp, who resembled a young Ulysses S. Grant, was quiet, calm and steady; Melville, bright and indomitably cheery. The civilians

In writing this story, Don Jackson often found himself awed by the courage and discipline of the Jeannette*'s crew, and by the amount of suffering they endured.*

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Collins and Newcomb seemed to be seasick much of the time. Collins was a nonstop punster whose humor often eluded the sailors. Little Newcomb had already been saddled with a derisive nickname—"Ninky"—but he took the ribbing well and did his job.

De Long fretted about his men and his leadership in letters and in the journal he faithfully kept. "I try to be gentle but firm, always calm and self-possessed," he wrote. "I feel my responsibility and care and I hope I appreciate the delicate position I am placed in of leading and directing so many people of my own age." After stopping at Unalaska they steamed on to St. Michael, midway up the Alaskan coast, where they recruited two Yupik Eskimos who would serve as hunters, and collected 40 sled dogs and a supply of fur clothing. Fully loaded with coal again, they crossed the Bering Strait and, under orders from the Navy Department, called at several Siberian settlements to inquire about a Swedish expedition voyaging west to east along the Siberian coast. Learning that the Swedes had come and gone, De Long was free now to aim for the pole, or as close as he could get in what was left of the summer; it was August 31.

Thickening ice on all sides sealed them in

His idea was to winter on unexplored Wrangel Land, some 500 miles west of Point Barrow, Alaska, and regarded by some as a possible land bridge to the pole though actually an island. Two days later they spotted the ice pack for the first time. They skirted it for two days, searching for leads of open water in the direction of Wrangel Land, then tried ramming their way through. But on September 6 they could go no farther; thickening ice on all sides sealed them in. The ship was frozen in place at a five-degree list to starboard. They didn't know it yet, but the *Jeannette* expedition was over before it had fairly begun.

De Long now confronted a daunting test of leadership. He had to preserve hope, morale and a sense of mission without yielding to frustration or despair. He lined out a daily schedule—up at 6, morning inspection, work assignments, lights out at 9. The meals, prepared by the two Chinese cooks, were excellent. Hunting parties went after polar bears and seals to supplement the menu, bagging the first bear in mid-September.

When the first snow fell, De Long issued the fur clothing and had the men build a snowbank around the ship for insulation. Sleds and boats were packed with provisions and stowed on the deck for a quick exit if ice crushed the ship. For the commander, the worst of it was thwarted ambition, triumph deferred, the awareness "that we attained no high latitude, made no discoveries or useful additions to scientific knowledge while consuming provisions, wearing out clothing and burning coal (for heat and cooking) to no purpose." In November, the ice pack made its first major assault on them.

Cracks appeared in the ice, detonating like cannon salvos. The moving ice formed hillocks and bergs that crashed into each other and advanced ominously close to the ship. Arctic veterans in the crew watched warily: this was how the Arctic killed. De Long likened the rampaging ice debris to "a marble yard adrift. Our floe bends and humps up like domes. Crash! The dome splits, another yard of floe breaks off, and on goes the flowing mass of rumbles, shrieks and groans." The men stayed dressed for a fortnight before the siege ended. De Long observed that they were "living over a powder mill."

Yet as the *Jeannette* drifted imperceptibly with the pack, two or three miles a day, moving sometimes north-

Venturing from the ship onto the frozen world around them, they shot bears and seals as food for men and dogs.

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west, then southeast, then back, there were also moments of haunting beauty known to none but Arctic sailors—the ship's rigging sparkling in a coverlet of frost, the northern lights illuminating crystal-rimmed ice fields and the ship's handsome lines, the frozen stillness that was almost palpable.

The men, for the most part, remained remarkably good-natured. The work regimen was undemanding, there were bear hunts and impromptu musicales (two accordions and several harmonicas were aboard) and the confident expectation that the ice would liberate them come summer. The main exceptions to the buoyant tone came from navigation officer Danenhower and meteorologist Collins. Danenhower's problem was physical: a severe eye disease rendered him unable to work. Dr. Ambler, who operated on the eye, diagnosed the condition as a consequence of syphilis, a finding that remained secret (except to De Long) through all that happened afterward. Collins was unhappy as a civilian subjected to military discipline. He defied De Long's order that all hands take two hours' exercise daily and resented the monthly physical exams the commander decreed. De Long eventually relieved him of his duties pending an investigation on their return home.

On Christmas 1879, the crew traipsed aft to deliver holiday greetings to the officers, then all sat down to feast on what a written menu identified as "Arctic turkey" (roast seal), and canned peas, succotash, macaroni, plum pudding and mince pie, accompanied by sherry and English stout. On New Year's Day they staged a show featuring several musical numbers, a martial arts demonstration by the Chinese cooks, and a skit with two crewmen in mourning over an empty brandy bottle.

A week later the floe that imprisoned the *Jeannette* lurched into menacing life again, and this time the pressure on the ship's reenforced sides caused a leak. Water sloshed into a storeroom and a forward hold at the rate of 60 gallons a minute. De Long set the crew to pumping while carpenters William Nindemann and Alfred Sweetman toiled for weeks in the icy water to find and repair the leak. Their heroic efforts (De Long made a note recommending both for the Medal of Honor) diminished the leak but didn't plug it. Engineer Melville improvised an emergency pumping system, using some of their precious coal to fuel a steam pump, and was finally able to clear the holds and neutralize the leak. In Melville's case, De Long wrote admiringly, "to see an improvement is to make it."

When summer brought only a partial thaw that wasn't enough to free the ship, the atmosphere onboard became discernibly gloomier. Cabin-fever tensions flared more often. Meals became oppressively predictable. De Long vented his deepening disappointment in his entry for June 21, 1880: "There can be no greater wear and tear on a man's mind than this life in the pack. The absolute monotony; the unchanging round of hours; the same faces; the same dogs; the same ice; the same conviction that tomorrow will be exactly the same as today, if not more disagreeable; the absolute impotence to do anything, to go anywhere, or to change one's situation an iota. All our books are read, our stories related, our games of chess, cards and checkers long since discontinued. . . . Though disappointed day after day we are cheerful and healthy, and—here we are."

And there they remained as another wet, foggy Arctic summer passed too quickly into another dark, nine-month-long winter. The dogs, the expedition's most unruly members, provided comic relief. Disturbed by one heave of the floe, De Long wrote, "they relieved their minds by fighting." Named and adopted by the men, the dogs had shown little interest thus far when called upon to pull sleds and, in fact, "repudiated utterly any labor or exertion."

By the time De Long made his passionate appeal to his crew's patriotic pride on the eve of New Year's 1881, a relief expedition was already under discussion back in the United States. The president of the American Geographical Society published a letter to President Rutherford Hayes supporting a rescue mission. Emma De Long and her 8-year-old daughter, Sylvie, staying with Emma's sister in Iowa, had heard nothing from the commander since his last letter from Alaska in August 1879. Like the British Franklin expedition that had sought the Northwest Passage 36 years earlier, the *Jeannette* had vanished into the northern mist. After due discussion, Congress passed a bill authorizing $100,000 for a *Jeannette* relief expedition, which departed on June 16, 1881.

With the ship gone, men and dogs set out across the jagged ice pack, hauling three small boats and supplies.

But even if the rescue effort had zeroed in on the *Jeannette*'s whereabouts, it was already too late. The ship's final agonies began with an ice assault against the port side on the afternoon of June 11. The groaning vessel was slowly crushed against the solid pack to starboard. Seams opened, decks buckled and the ship heeled over to 22 and then 30 degrees. The men hurriedly unloaded the boats, sleds, food and other supplies as water filled the holds so fast that a few were nearly trapped belowdecks. De Long gave the abandon-ship order at 8 P.M., and the company camped amid the crates and barrels on the ice. At 4 the next morning the gallant *Jeannette*, its yardarms stripped so it resembled what Melville described as "a great gaunt skeleton clapping its hands above its head," went down in 40 fathoms.

Switching to boats when they hit open water

They spent five days carefully inventorying their supplies and loading them, along with their three heavy boats, onto five sleds. De Long calculated that they had 60 days' provisions for the 400- to 500-mile journey to the northeastern coast of Siberia. The uninhabited New Siberian Islands lay between them and the mainland, but their best chance was to head for the delta of the Lena River, where there were known to be scattered settlements. They would advance over the ice by sled and switch to the boats when they hit open water, traveling between 6 P.M. and 6 A.M.—it remained light through the summer nights—to escape the midday glare.

In an Arctic gale, running before great waves that threatened to swamp them, they surged toward Siberia.

It took only a day of grinding, punishing toil by men and dogs, both in harness, to realize that the sleds were overloaded. Rather than move everything forward simultaneously, they would have to lighten the loads (to 1,600 pounds per sled) and make repeated trips—six round-trips every day. At this pace they covered about two miles a day, though they mushed 25 to 30 to do it. They slogged through knee-deep snow and over jagged ice hillocks, painstakingly bridging narrow water leads with chunks of ice. Sometimes the ice gave way, pitching men, dogs and sleds into the frigid sea; a crewman plucked De Long from the water by his beard after one such dunking. The miserable trek across the pack was "conceded by everybody," De Long wrote, "to be the hardest work they ever had." Men fainted from exhaustion, got up and plodded on, the soles of their moccasins shredding as moisture softened them. They labored with minimal grumbling and even managed a cheery note or two—there was a harmonica serenade the first night they camped on the ice. "No ship's company," Melville declared, "ever endured such severe toil with so little complaint."

William Dunbar, a veteran whaler from New London, Connecticut, who was the expedition's ice pilot, roamed ahead each day to scout a route, marking it with flags. The Eskimo hunters, Alexey and Aniguin, scanned the horizon for bears, seals, walruses and birds. Danenhower and others on the sick list rode a special sled. They headed due south, but this changed when De Long made a startling and dispiriting discovery after a backbreaking week on the move. His instruments showed that they were actually 28 miles north of their starting point—the pack had drifted north faster than they had walked south. He changed course to compensate.

Their most abundant food was pemmican, the powdery mix of dried meat, fat and raisins, eaten like cake, that would long remain a staple of polar expeditions. The temperature rarely topped 30 degrees, but they still sweated as they strained at their harnesses. As they pushed south, the size and frequency of the water leads increased, and they began using the boats to cross the larger patches, though every shift required a laborious transfer of boats to sleds or vice versa. When Dunbar spotted an unknown outcrop of barren, rocky land,

Suddenly Chipp's boat ceased rising and falling and plunged from sight; nothing was ever seen of it again.

De Long led a slog over swift-moving floes and ice-clogged channels to an island, claiming it for the United States and naming it after their sponsor, Bennett. He left a report on the expedition in a cairn, noting that they had three boats, 30 days' provisions and 23 dogs, and were in "excellent health." He added that "we have lost none of our original number," a claim that would hold true just five weeks longer.

By mid-August the phantom Arctic summer was already fading, the weather turning cold and stormy. Their bread ran out, then coffee and then tobacco. But it finally looked like there was water enough for them to stay with the boats, and De Long ordered the sleds broken up. That made the dogs unnecessary, and he had most of them shot. Another four leaped onto a floe, and he declined to pursue them, floating away as their pitiful howls grew fainter in the distance. Only one dog remained—Snoozer, the captain's favorite.

They waited out storms for ten days on a floe near the New Siberian Islands. When the weather improved they at last began to make good time under sail, running before icy winds. They stopped at two islands but spotted no signs of life save some long-abandoned huts and a single human footprint. De Long was in the largest of the three boats, a cutter, with the doctor, Collins and 11 others. Melville, with Danenhower, Newcomb and eight others, manned the slightly smaller whaleboat; Chipp, Dunbar and another six men crewed a considerably smaller cutter.

Numb with cold and exhaustion, they kept bailing

With nothing between them and Siberia now but open sea, the little fleet whirled across the ice-spackled Arctic, shivering through a breathtaking advance of 50 miles in a day. De Long was making for a point on the coast identified on his rudimentary chart as Cape Barkin. But on September 12 their cruelly short string of good luck ran out. A severe gale kicked up, bearing seas Danenhower described as "high and spiteful." Tremendous waves repeatedly swamped all three boats, and it seemed incredible to Melville that they remained afloat. As Melville watched, Chipp's little boat rose and fell crazily in the tumultuous waves. He saw a man try to free the sail from where it had been jammed against the mast, then saw the craft plunge out of sight again, then nothing—no sail, no boat, no sign of the men in the gathering dusk. Lieut. Charles Chipp, William Dunbar, the Medal of Honor candidate Alfred Sweetman and the five other men in the small cutter were never seen again, nor did any sign of their boat ever turn up.

In Melville's own boat the men bailed furiously, numb with cold and exhaustion, the boat constantly on the brink of capsizing. De Long, standing in the bow of his cutter midway between Melville and where Chipp had been, seemed to be trying to signal Melville, but it was impossible to understand the message. Melville's lighter, faster boat drew ahead, and he was soon out of sight of the captain. The gale lashed them through a night Melville described as "an incubus of horrors."

When the storm finally relented, the boats commanded by Melville and De Long were several miles apart and headed in different directions, Melville steering toward the southeastern shore of the vast, fan-shaped Lena Delta while De Long's men rowed their dismasted craft toward the northern coast. Neither knew if the other had survived. They now confronted a tundra wilderness, a trackless maze of channels, streams, sand spits and mudflats that changed so often with the annual floods that it was impossible to map. The best time to travel was winter, when the hundreds of watercourses were frozen. They had arrived between seasons, with ice beginning to form and the first snow falling. Melville's men were lucky. Alternately rowing and sailing, they reached the

At the end De Long had his dog, Snoozer, killed to make stew for the starving men, but he refused to touch it.

coast on September 16 and entered a major outlet of the Lena. They rested that night in a vacant hut built by Tungus, native Siberians who eked out a sustenance in this unforgiving land by hunting and fishing. For the next two days they tried to follow the main stream through a labyrinth of islands and meandering channels. Then, on the 19th, they suddenly came upon three hunters in canoes. The three reacted warily at first, but one approached when offered a piece of pemmican. Within a few hours they were showing each other their possessions and sharing a meal, the sailors happily diving into proffered fish, goose and venison. Melville was mildly abashed when one of his jubilant men, "more gushing than the rest, kissed each native on both cheeks, which salutation they received with stolid amazement." For Melville and the ten men in his charge the ordeal of the *Jeannette* was at last at an end. Long months would pass before the last of them would escape Siberia, but their survival was no longer in doubt.

De Long and his 13 storm-weary, frostbitten men reached land on the 17th at a point some 70 miles northwest of where Melville did. Their boat grounded a mile and a half offshore, forcing them to lug their baggage through waist-deep water to the shingle beach. Thorough and methodical as always, De Long jettisoned their excess gear and left another message, reporting optimistically that they were "all well—have four days' provisions," and that they would head for a village he believed to be 95 miles south. He was unaware of another village only 30 miles to the west.

They plodded through the slushy snowscape, the weather worsening daily, Snoozer trotting alongside the gimpy men hauling a sled loaded with their supplies and records. They could advance only a few miles a day and lost more time waiting for streams to freeze so they could cross. On October 1 the doctor amputated five frostbitten toes from seaman Hans Erikson. They were living now on the meat of three reindeer bagged by the hunter Alexey, but it lasted only a few days.

De Long, a man who rarely took a step without careful planning and forethought, was adrift now in a place without landmarks, where his map was useless and military certainty had vanished. His men were barely strong enough to travel. On the 3rd he ordered Snoozer killed and butchered. They made a stew of the meat, but he and Dr. Ambler couldn't eat it. "Such a dreary, wretched night I hope I shall never again see," he wrote.

Erikson died on the 6th. Three days later, October 9, 1881, De Long sent William Nindemann and Louis Noros, the two who seemed strongest, ahead for help. The 11 remaining raised a feeble cheer as the pair slogged off carrying blankets, a rifle and ammunition and two ounces of alcohol. Over the next 12 days De Long and the others, stymied part of the time by another gale, could average only a mile a day. Alexey, the quiet Alaskan who De Long had always admired, died on the 17th.

The journal entries now dwindled to a line or two a day: "Breakfast—willow tea and two old boots . . . divine service . . . horrible night . . . hardly strength to get firewood." Walter Lee and Heinrich Kaak succumbed to exposure and starvation on October 21. Their number was now down to eight. The last entries in the captain's journal finish the terrible story: "October 27—Iversen broken down. October 28—Iversen died during early morning. October 29—Dressler died during night. October 30—Boyd and Gortz died during the night. Mr. Collins dying." That was the final entry. De Long, Dr. Ambler and the Chinese cook Ah Sam probably died the next day. Nindemann and Noros had meanwhile straggled south for almost two weeks before they found help, but when they did they couldn't communicate. Some nomads discovered them more dead than alive in a hut where they had taken refuge after trekking more than 100 miles on a diet of willow tea, fish heads they had found and an occasional chaw of their sealskin breeches. They were taken to a village where they tried to explain that their comrades desperately needed assistance, but the villagers stared blankly at them. After

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Offer expires May 31, 1997.

**** Mail Card ** or ** Fax Response to ** 716-292-1415 ****

a week, help finally appeared in the astounded person of Melville, who had learned of their arrival. "My God, Mr. Melville," Noros cried at their reunion, "are you alive?" Melville immediately sent messages via courier to the government and the *Herald*, then rounded up two dogsled teams and drivers and set out to search for De Long. He backtracked over the route Nindemann and Noros had followed and eventually met native hunters who brought him two of De Long's cached messages, which in turn led him to the equipment the commander had deposited when he landed. But this was all he and the others could accomplish before weather and a shortage of food forced them to halt after 23 days. America learned just before Christmas 1881 that the *Jeannette* had sunk, Melville and one boatload of men had survived and De Long was unaccounted for in northern Siberia. Emma kept hope green by writing frequent letters to her husband. The *Herald* dispatched a reporter to Siberia, a journey by train and sled that took nearly two months from the capital at St. Petersburg. A multipart interview with John Danenhower began appearing in late April of 1882. Four installments had run when the chilling news arrived on May 6 that Melville and Nindemann had found the bodies. Nindemann had first spotted the wreck of a boat he remembered seeing soon after he and Noros left De Long. Not far away they found four poles lashed together and, buried in the snow beneath them, the bodies of seamen Boyd and Gortz. Melville climbed a nearby embankment, and as he walked toward a cooking pot, he almost stumbled over a frozen arm protruding from the snow. It was De Long. Doctor Ambler and Ah Sam were close by. The commander's last notebook, with its poignant, meticulous record of his glorious explorer's dreams and their tragic denouement in the Lena Delta, lay six inches from his shoulder.

Melville's rescue party "almost stumbled over a frozen arm protruding from the snow. It was De Long."

Patented microelectronic antenna converts your home's wiring into a giant signal-grabbing magnet!

This little box uses your home's electrical wiring to give non-subscribers, cable subscribers and satellite users better TV reception on your local broadcast networks!

Until recently, the only convenient way to guarantee great TV reception was to have cable installed or place an antenna on top of your TV. But who wants to pay a monthly cable fee just to get clear reception, or have rabbit-ear antennas that just don't work on all stations? Some people just aren't interested in subscribing to cable. Or they may live in an area where they can't get cable and TV-top antennas aren't powerful enough. And what about those people who have cable or satellite systems but still can't get certain local stations in clearly?

Now, thanks to fifteen years of microelectronics research, a new device has been developed that actually makes conventional antennas a thing of the past. It's called the Spectrum Universal Antenna/Tuner!

Advanced technology. If you live in a rural area, you may have resigned yourself to accept the fact that your local TV reception is poor. (This may be true even if you *don't* live in a rural area!) Now imagine watching TV and seeing a picture clearer than before. Simply plug the Spectrum Antenna into a standard AC outlet and plug your TV into the Spectrum. Get ready for great reception because your TV will display a clearer, focused picture, thanks to Spectrum's advanced signal controls.

Uses your home's electrical wiring. The Spectrum Antenna is a sophisticated electronic device that plugs into a standard wall outlet. Basically, the outlet interfaces the Spectrum with the huge antenna that is your home wiring network. Simply put, it turns the electrical wiring in your house or apartment into a multi-tunable TV reception antenna that will improve your TV's overall tuning capability.

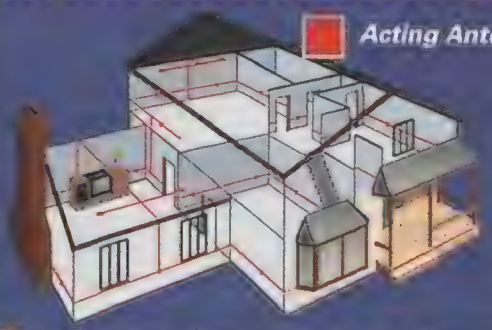
How it works. Broadcast TV signals are sent out from the local broadcast station. Those signals interface with your home's AC power line system, creating an aerial antenna network of wiring as large as your home itself. When the Spectrum Antenna connects to the AC line, the signal is sent to its signal processing circuit. It processes and separates the signal into 12 of the best possible antenna configurations. These specially-processed signals route themselves into 12 separate circuits. A 12-position rotary tapping switch, the "Signal Switch" control, gathers 12 of the best antenna configurations resulting in improved picture quality.

Spectrum Antenna
Parallel 75 ohm resistance
For minimum loss of signal
Signal search control
For selecting multiple antenna configurations
Resonant fine tuner control
For dialing in crisp, clear TV/stereo reception, eliminates ghosting
Dual outlets with surge protection
For plugging in additional TV/stereo equipment guarding against damage and surges
Polarized three-prong plug for grounding
For optimum signal grounding to stop noise and static

Why don't conventional antennas work as well as the Spectrum?

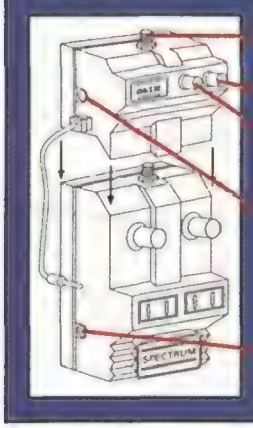
When TV signals are tuned at the TV channel's center frequency, optimum tuning has been achieved.

Other antennas can't offer center frequency tuning like the Spectrum Antenna can. They only offer such tuning up to the edge of the center frequency. As a result your TV picture remains snowy.



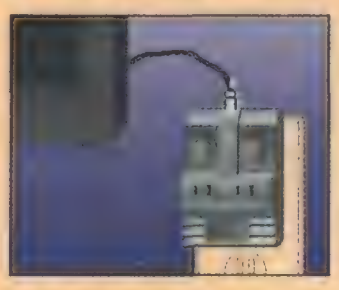
The Spectrum Antenna "activates" the giant antenna that already is in your home. It uses all of the wiring throughout your home's walls and ceilings to make an antenna as large as your house for unbelievably clear reception of local broadcasting.

Spectrum with Gain Booster Features



Who can use Spectrum?

- *Cable users-You have cable but you can't get certain local stations in clearly.*
- *Non-cable users-You don't have cable and want the stations to come in more clearly.*
- *Satellite users-You have a digital satellite system but can't get local stations clearly.*



The Spectrum Antenna gets plugged into a three-prong outlet and can accommodate two additional plugs in its surge protected ports.

The "Signal Search" offers varying antenna configurations for you to select from the best signals of all those being sent. The signal then passes through the Spectrum Antenna's special "Fine Tuner" circuit for producing more clear reception.

Rural areas. Most TV signals in rural areas are weak, making them harder to fine tune. The "Gain Booster" is a high-frequency signal booster designed to increase the output level of the signal entering your television. It delivers a 10-fold greater signal which will bring richer color and a noise-free picture. By using the Gain Booster, Spectrum's fine tuning controls will function better, giving it a stronger signal to tune. It also works in conjunction with your outdoor antenna!

Risk-free. The Spectrum Antenna/Tuner comes with our 90-day risk-free trial as well as a 90-day manufacturer's warranty. Try it yourself, and if you're not satisfied, return it for a "No Questions Asked" refund.

Limited time offer! We realize that most people have more than one TV in their home. That's why we're offering a special discount on additional Spectrum Antennas so you get great reception on all your TVs!

Spectrum Antenna.....**$39** $4 S&H
Additional antennas just.....$34 S&H free

Gain Booster.....**$19** $2 S&H
Please mention promotional code **2154-10544.**

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It's your future.
BE THERE.

Your future is too valuable a thing to risk with **high cholesterol.** If you do something now, you may improve your chances of being there to play your part.

High cholesterol can lead to heart disease (and death). If you've been trying to lower your cholesterol with diet and exercise, and still haven't reached your goal, ask your doctor about adding ZOCOR.

More than 3.1 million people around the world have taken ZOCOR. It works by reducing potentially dangerous levels of LDL (bad) cholesterol in the bloodstream. Results can vary, but ZOCOR is the only medicine that's actually been proven to help save the lives of people with high cholesterol and heart disease.

A landmark five-year study among heart disease patients with high cholesterol demonstrated dramatic results for ZOCOR: fewer cardiac procedures, fewer heart attacks, and 42% fewer deaths from heart disease.

ZOCOR is a prescription medication and only your doctor or health care professional can determine whether you should take it. In clinical studies, liver abnormalities were experienced by 1% of patients. Some people should not take ZOCOR: people with active liver disease or possible liver problems, women who are pregnant, likely to become pregnant, or are breast-feeding, or people who are allergic to any of its ingredients.

When you talk to your doctor about ZOCOR, be sure to mention any medications you are taking, to avoid possible serious drug interactions. Be sure to tell your doctor if you experience any unexplained muscle pain or weakness while taking ZOCOR, since this could be a sign of serious side effects. Finally, discuss any other side effects with your doctor.

To get your free copy of "Surviving High Cholesterol," call **1-800-224-4042.** Visit our Web site at **http://www.zocor.com**

Please read the next page for a summary of prescribing information and discuss it with your doctor.

Ask your doctor about ZOCOR– the only cholesterol medicine proven to help save lives among people with high cholesterol and heart disease.

- Does my high cholesterol put me at risk?
- Should I consider adding ZOCOR to my diet and exercise plan?
- Could ZOCOR reduce my chances of having a heart attack?
- What are the side effects of ZOCOR?
- What type of results can I expect from ZOCOR?

ZOCOR is indicated as an addition to diet for patients with high cholesterol when diet and exercise are inadequate.

ZOCOR. The cholesterol medicine that helps save lives. MERCK

ZOCOR®
(SIMVASTATIN)

PLEASE READ THIS SUMMARY CAREFULLY, AND THEN ASK YOUR DOCTOR ABOUT ZOCOR. NO ADVERTISEMENT CAN PROVIDE ALL THE INFORMATION NEEDED TO PRESCRIBE A DRUG. THIS ADVERTISEMENT DOES NOT TAKE THE PLACE OF CAREFUL DISCUSSIONS WITH YOUR DOCTOR. ONLY YOUR DOCTOR HAS THE TRAINING TO WEIGH THE RISKS AND BENEFITS OF A PRESCRIPTION DRUG FOR YOU.

USES OF ZOCOR

ZOCOR is a prescription drug that is indicated as an addition to diet for many patients with high cholesterol when diet and exercise are inadequate. For patients with coronary heart disease (CHD) and high cholesterol, ZOCOR is indicated as an addition to diet to reduce the risk of death by reducing coronary death; to reduce the risk of heart attack; and to reduce the risk for undergoing myocardial revascularization procedures (coronary artery bypass grafting and percutaneous transluminal coronary angioplasty).

WHEN ZOCOR SHOULD NOT BE USED

Some people should not take ZOCOR. Discuss this with your doctor.

ZOCOR should not be used by patients who are allergic to any of its ingredients. In addition to the active ingredient simvastatin, each tablet contains the following inactive ingredients: cellulose, lactose, magnesium stearate, iron oxides, talc, titanium dioxide, and starch. Butylated hydroxyanisole is added as a preservative.

Patients with liver problems: ZOCOR should not be used by patients with active liver disease or repeated blood test results indicating possible liver problems. (See WARNINGS.)

Women who are or may become pregnant: Pregnant women should not take ZOCOR because it may harm the fetus. **Women of childbearing age should not take ZOCOR unless it is highly unlikely that they will become pregnant.** If a woman does become pregnant while on ZOCOR, she should stop taking the drug and talk to her doctor at once.

Women who are breast-feeding should not take ZOCOR.

WARNINGS

Liver: About 1% of patients who took ZOCOR in clinical trials developed elevated levels of some liver enzymes. Patients who had these increases usually had no symptoms. Elevated liver enzymes usually returned to normal levels when therapy with ZOCOR was stopped.

Your doctor should perform routine blood tests to check these enzymes before and during treatment with ZOCOR. The tests should occur at 6 weeks and 12 weeks after you begin taking ZOCOR, and about every 6 months thereafter. If your enzyme levels increase, your doctor should order more frequent tests. If your liver enzyme levels remain unusually high, your doctor should discontinue your medication.

Tell your doctor about any liver disease you may have had in the past and about how much alcohol you consume. ZOCOR should be used with caution in patients who consume large amounts of alcohol.

Muscle: Tell your doctor right away if you experience any muscle pain, tenderness, or weakness at any time during treatment with ZOCOR, particularly if you have a fever or if you are generally not feeling well, so your doctor can decide if ZOCOR should be stopped. Some patients may have muscle pain or weakness while taking ZOCOR. Rarely, this can include muscle breakdown resulting in kidney damage. The risk of muscle breakdown is greater in patients taking certain other drugs along with ZOCOR, such as the lipid-lowering drug Lopid* (gemfibrozil), a fibrate; lipid-lowering doses of nicotinic acid (niacin); the antibiotic erythromycin; antifungal drugs that are azole derivatives, such as itraconazole; or drugs that suppress the immune system (called immunosuppressive drugs, such as Sandimmune [cyclosporine]). Therapy with ZOCOR should be temporarily interrupted if you are going to take an azole derivative antifungal medication, such as itraconazole. Patients using ZOCOR along with any of these other drugs should be carefully monitored by their physician. The risk of muscle breakdown is greater in patients with kidney problems or diabetes.**

If you have conditions that can increase your risk of muscle breakdown, which in turn can cause kidney damage, your doctor should temporarily withhold or stop ZOCOR. Such conditions include severe infection, low blood pressure, major surgery, trauma, severe metabolic, endocrine and electrolyte disorders, and uncontrolled seizures. Discuss this with your doctor, who can explain these conditions to you.

Because there are risks in combining therapy with ZOCOR with lipid-lowering doses of nicotinic acid (niacin) or with drugs that suppress the immune system, your doctor should carefully weigh the potential benefits and risks. He or she should also carefully monitor patients for any muscle pain, tenderness, or weakness, particularly during the initial months of therapy and if the dose of either drug is increased. Your doctor may also monitor the level of certain muscle enzymes in your body, but there is no assurance that such monitoring will prevent the occurrence of severe muscle disease.

PRECAUTIONS

Before starting treatment with ZOCOR, try to lower your cholesterol by other methods such as diet, exercise, and weight loss. Ask your doctor about how best to do this. Any other medical problems that can cause high cholesterol should also be treated.

ZOCOR is less effective in patients with the rare disorder known as homozygous familial hypercholesterolemia.

Drug Interactions: Because of possible serious drug interactions, it is important to tell your doctor what other drugs you are taking, including those obtained without a prescription.

ZOCOR® (simvastatin) can interact with Lopid, niacin, erythromycin, certain antifungal drugs, and drugs that suppress the immune system (called immunosuppressive drugs, such as Sandimmune). (See WARNINGS, Muscle.)

Some patients taking lipid-lowering agents similar to ZOCOR® (simvastatin) and coumarin anticoagulants (a type of blood thinner) have experienced bleeding and/or increased blood clotting time. Patients taking these medicines should have their blood tested before starting therapy with ZOCOR and should continue to be monitored.

Endocrine (Hormone) Function: ZOCOR and other drugs in this class may affect the production of certain hormones. Caution should be exercised if a drug used to lower cholesterol levels is administered to patients also receiving other drugs (e.g., ketoconazole, spironolactone, cimetidine) that may decrease the levels or activity of hormones. If you are taking any such drugs, tell your doctor.

Central Nervous System Toxicity; Cancer, Mutations, Impairment of Fertility: Like most prescription drugs, ZOCOR was required to be tested on animals before it was marketed for human use. Often these tests were designed to achieve higher drug concentrations than humans achieve at recommended dosing. In some tests, the animals had damage to the nerves in the central nervous system. In studies of mice with high doses of ZOCOR, the likelihood of certain types of cancerous tumors increased. No evidence of mutations of or damage to genetic material has been seen. In one study with ZOCOR, there was decreased fertility in male rats.

Pregnancy: Pregnant women should not take ZOCOR because it may harm the fetus.

Safety in pregnancy has not been established. There have been no reports of birth defects in the children of patients taking ZOCOR. However, in studies with lipid-lowering agents similar to ZOCOR, there have been rare reports of birth defects of the skeleton and digestive system. Therefore, women of childbearing age should not take ZOCOR unless it is highly unlikely they will become pregnant. If a woman does become pregnant while taking ZOCOR, she should stop taking the drug and talk to her doctor at once. The active ingredient of ZOCOR did not cause birth defects in rats at 6 times the human dose or in rabbits at 4 times the human dose.

Nursing Mothers: Drugs taken by nursing mothers may be present in their breast milk. Because of the potential for serious adverse reactions in nursing infants, a woman taking ZOCOR should not breast-feed. (See WHEN ZOCOR SHOULD NOT BE USED.)

Pediatric Use: ZOCOR is not recommended for children or patients under 20 years of age.

SIDE EFFECTS

Most patients tolerate treatment with ZOCOR well; however, like all prescription drugs, ZOCOR can cause side effects, and some of them can be serious. Side effects that do occur are usually mild and short-lived. Only your doctor can weigh the risks versus the benefits of any prescription drug. In clinical studies with ZOCOR, less than 1.5% of patients dropped out of the studies because of side effects. In a large, long-term study, patients taking ZOCOR experienced similar side effects to those patients taking placebo (sugar pills). Some of the side effects that have been reported with ZOCOR or related drugs are listed below. This list is not complete. Be sure to ask your doctor about side effects before taking ZOCOR and to discuss any side effects that occur.

Digestive System: Constipation, diarrhea, upset stomach, gas, heartburn, stomach pain/cramps, anorexia, loss of appetite, nausea, inflammation of the pancreas, hepatitis, jaundice, fatty changes in the liver, and, rarely, severe liver damage and failure, cirrhosis, and liver cancer.

Muscle, Skeletal: Muscle cramps, aches, pain, and weakness; joint pain; muscle breakdown.

Nervous System: Dizziness, headache, insomnia, tingling, memory loss, damage to nerves causing weakness and/or loss of sensation and/or abnormal sensations, anxiety, depression, tremor, loss of balance, psychic disturbances.

Skin: Rash, itching, hair loss, dryness, nodules, discoloration.

Eye/Senses: Blurred vision, altered taste sensation, progression of cataracts, eye muscle weakness.

Hypersensitivity (Allergic) Reactions: On rare occasions, a wide variety of symptoms have been reported to occur either alone or together in groups (referred to as a syndrome) that appeared to be based on allergic-type reactions, which may rarely be fatal. These have included one or more of the following: a severe generalized reaction that may include shortness of breath, wheezing, digestive symptoms, and low blood pressure and even shock; an allergic reaction with swelling of the face, lips, tongue and/or throat with difficulty swallowing or breathing; symptoms mimicking lupus (a disorder in which a person's immune system may attack parts of his or her own body); severe muscle and blood vessel inflammation; bruises; various disorders of blood cells (that could result in anemia, infection, or blood clotting problems) or abnormal blood tests; inflamed or painful joints; hives; fatigue and weakness; sensitivity to sunlight; fever, chills; flushing; difficulty breathing; and severe skin disorders that vary from rash to a serious burn-like shedding of skin all over the body, including mucous membranes such as the lining of the mouth.

Other: Loss of sexual desire, breast enlargement, impotence.

Laboratory Tests: Liver function test abnormalities including elevated alkaline phosphatase and bilirubin; thyroid function abnormalities.

NOTE: This summary provides important information about ZOCOR. If you would like more information, ask your doctor or pharmacist to let you read the professional labeling and then discuss it with them.

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West Point, PA 19486

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Mountain Hikes in Austria and Italy *July 5-19*

Impressions of a Swedish Summer *July 7-14*

Danube River Journey *July 9-22* Aboard the *River Cloud*.

North Pole Voyage *July 17-August 2* Aboard the icebreaker *Yamal*.

Galápagos Islands for Families *July 19-29* Aboard the *Santa Cruz*.

Great Journey through Europe *July 27-August 9* Includes France and Holland.

Scandinavia and St. Petersburg Voyage *July 27-August 13* Aboard the *Regina Renaissance*.

Kenya Family Summer Safari *August 2-15*

The Great Siberian Rail Adventure *August 16-September 3* Includes two days aboard the Trans-Siberian Express.

Journey through Russia *August 17-September 1* Aboard the *Furmanov*.

The Dalmatian Coast (Croatia) *August 18-30* Aboard the *Halcyon*.

North Atlantic Passage *August 26-September 15* Aboard the *Seabourn Pride*.

U.S. & Canada Tours

Smithsonian "Anytime" Weekend (Washington, D.C.) Value package includes two nights' accommodations, lunch at a Smithsonian museum, a private tour of the Castle, and much more. Choose from four hotels: Loews L'Enfant Plaza, the Mayflower Hotel, the Holiday Inn Capitol and the Channel Inn. Prices begin at $215 for two people and include parking.

Spring Gardens of the Delaware Valley (Pennsylvania and Delaware) *May 7-13*

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Discover Pittsburgh *June 4-8*

Railroading the Appalachians (Maryland, Pennsylvania and West Virginia) *June 6-14*

People of the Red Earth: Oklahoma Native Americans *June 6-15*

Ottawa, Kingston and the Thousand Islands (Ontario, Canada) *June 14-19*

Quebec and the Islands of the St. Lawrence *June 20-28*

Hudson River Homes and Gardens (New York) *June 22-28*

The Montana Rockies by Private Rail *June 24-July 2* A nostalgic adventure.

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Concentrated study of specific topics

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The New Astronomies (Tucson, Arizona) *May 20-26*

Revolutionary War: Boston to Concord (Massachusetts) *May 21-25*

Classic Mystery Lover's England *June 16-26* Explore the lives and works of classic English detective novelists.

Journal Writing in the Grand Tetons (Wyoming) *July 6-11* Renew your spirit through the process of journal writing.

Renoir Portraits: Impressions of an Age (Ottawa, Canada) *July 16-20*

The Battle of Little Bighorn (Montana and Wyoming) *July 16-21*

Newport Music Festival (Rhode Island) *July 17-22*

The Art & Craft of Creative Writing (Pacific Grove, California) *July 20-24*

The Carmel Bach Festival (Carmel, California) *July 25-30*

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Grand Mediterranean Cruise aboard the *Marco Polo* (Spain, France, Italy, Greece) 12-night tours in *May, September or October*

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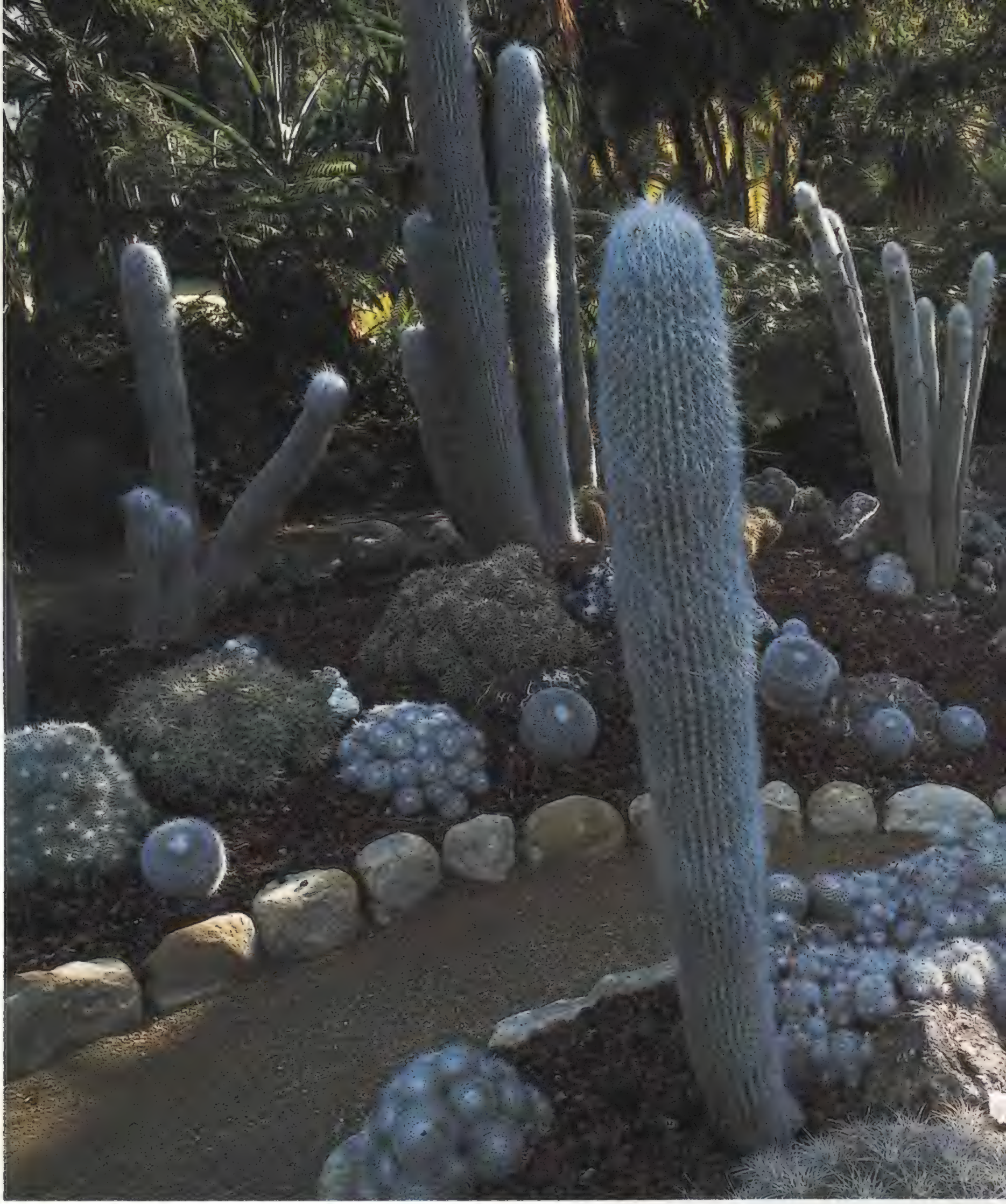
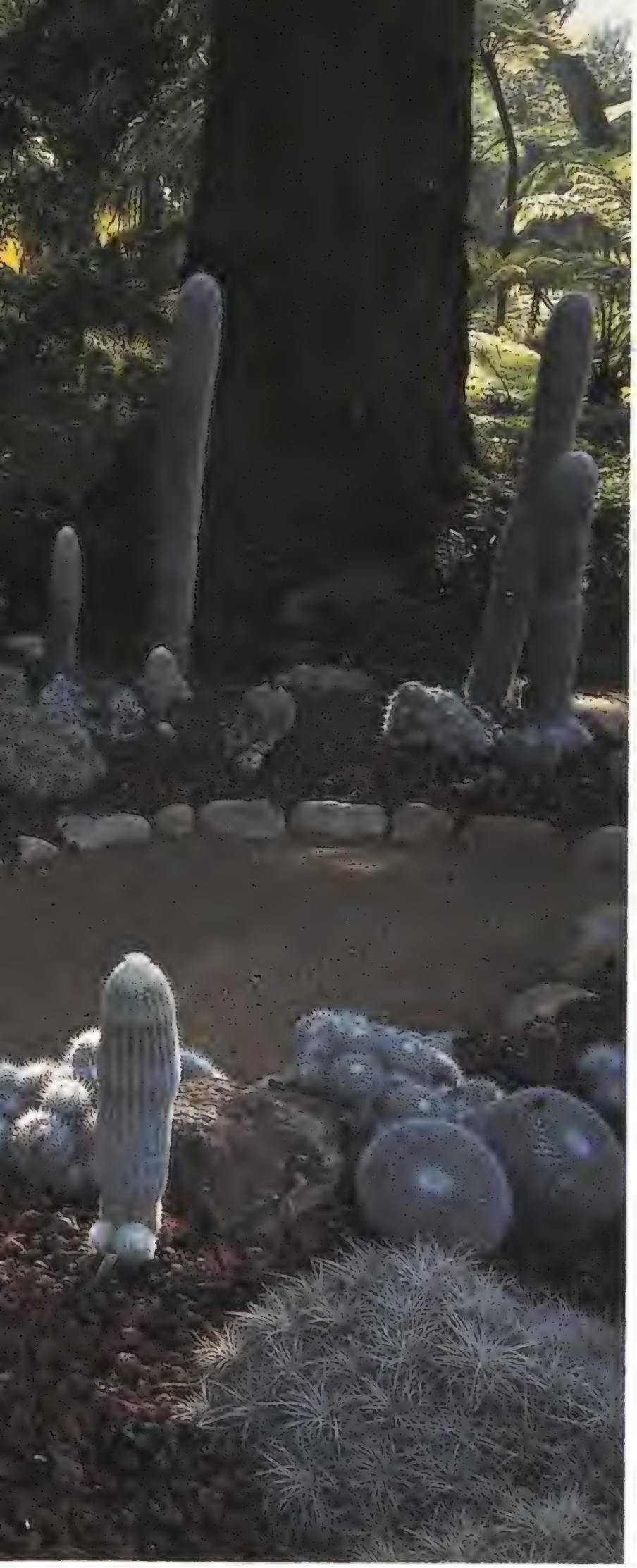


By Edwin Kiester jr.

‘Not your average backyard gardener’



Ganna Walska pursued life with a passion, from husbands to opera to plants. Her legacy is Lotusland, an exotic California garden

A glamorous Walska was painted at the command of Czar Nicholas II. Later in life she turned to gardening, lining a walkway of her estate with cacti.

The gardens of Versailles, it isn't. Well, sure, you walk around a scrupulously barbered hedgerow and emerge into a neat rose garden laid out in precise geometric beds. The Sun King probably would have liked that. And down by the Japanese pond where golden koi swim languidly, a bed of crowd-pleasing azaleas blossom in scarlet, crimson and lavender. But any flower lover expecting a formal ornamental garden will surely be disappointed at Ganna Walska Lotusland, 37 exotic acres sprawled across a hillside in Montecito, California.

Here, vivid blooms give way to muted greens and grays and beiges, in spiky, droopy and phantasmagoric shapes. Towering needle-leafed tree ferns shade the curving gravel walks with greenish gloom. Small succulents called burro's tails hang from live oaks, protected from marauding birds by conical hats fashioned of copper mesh. Dragon trees drip what looks like human blood. Cacti bristle and palms fan the sky. More than 100 species of bromeliads catch rainfall in miniature reservoirs formed by their leaves. Perhaps the most prized display is made up of rare cycads, plants dating from the days of the dinosaurs.

But then why should Ganna Walska Lotusland be ordinary? Nothing about the woman who created this fan-

Photographs by Wm. B. Dewey and Robert Glenn Ketchum

tasyland, including her made-up name, was done by the book. "She called herself an enemy of the average," says Lotusland curator Virginia Hayes of the eccentric woman whose ten passports, found after her death, listed two different birth dates. Never forthcoming about her personal life, she was "both flamboyant and mysterious," adds executive director Steven Timbrook.

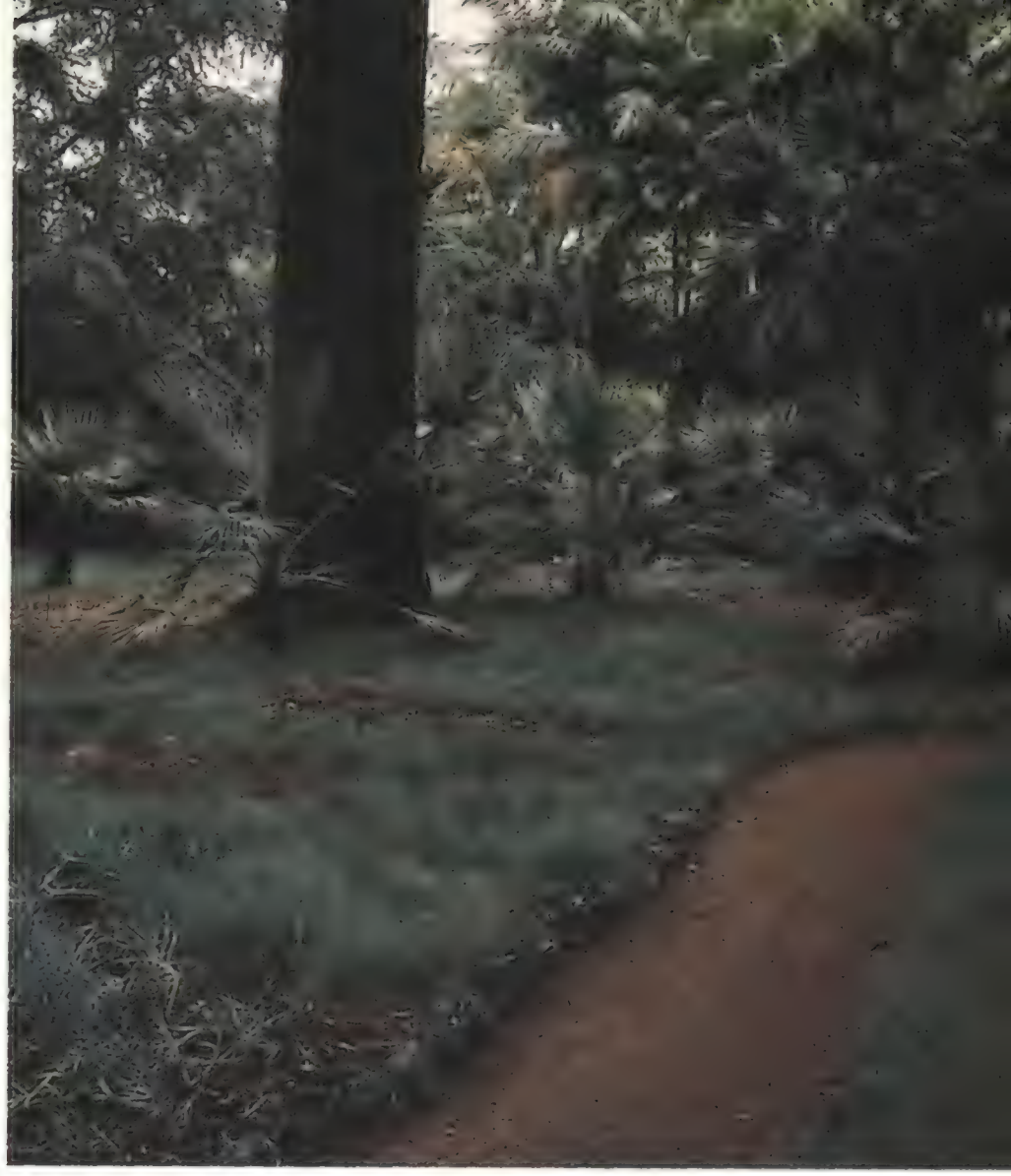
Madame Walska died in 1984, and Ganna Walska Lotusland opened to the public only in 1993, after protracted negotiations with neighbors in the nearby secluded estates who feared weekend traffic jams and roaring tourist buses. County law now limits visitors to 9,000 per year, admitted in small, docent-led groups and by reservation only. The gardens are already fully booked for the general public through 1997.

Born plain Hanna Puacz in czarist-ruled Poland, possibly in 1887, she moved to the imperial capital, St. Petersburg, in her teens and soon changed her first name to its Russian version, Ganna, and adopted Walska in honor of her favorite three-quarter-time dance. With her raven hair, patrician profile, swan-like neck and ample bosom atop a trim figure, she was quickly acknowledged as a great beauty. A portrait now hanging in her niece's home was said to have been painted by royal command after Czar Nicholas II judged her the most beautiful woman at a palace ball.

To attract the attention of "the second richest man in Russia," who happened to hold an important position at the Imperial Opera, said Walska in her rambling and not always credible autobiography, she embarked on an operatic career. To be charitable, her days as Madame Butterfly were not a smashing success. She was better known for her extravagant costumes and overdone jewelry than her singing, which was marked by sudden sore throats, stage fright, abrupt cancellations, and a certain inability to stay on key. In one appearance the audience let fly with vegetables. Nonetheless, she profitably married and divorced some of the world's richest men, with each liaison gushingly chronicled in headlines, and wound up with two fortunes, a chateau, houses in New York and Paris, and a Paris theater.

Husband number six, an American who had been accepted as a lama in Tibet, and some 20 years her junior, introduced her to Tibetan mysticism and persuaded her

Edwin Kiester jr. writes regularly for SMITHSONIAN. *His California garden consists of impatiens and azaleas in boxes on a deck. He does not give tours.*



At Lotusland (from left to right) *Euphorbia ingens* send writhing arms to the ground; a pool rimmed with abalone shells is a centerpiece of the aloe garden; and chunks of glass border a path in the blue garden.

to buy the California property where he had hoped to start a retreat for visiting lamas. After they were divorced, she turned her back on marriage for good, changed the name of her new estate from Tibetland to Lotusland and threw her considerable energy into creating a showplace garden. Earlier owners and landscape designers had lovingly planted the property, but she set out to transform it.

From a botanist's point of view, says Virginia Hayes, what she wrought over the next 40 years was "a wonderful classroom. You could talk about almost anything in the whole realm of botany and find an illustration here." However, Hayes continues, "she was not your average backyard gardener. Her design ideas and choice in plants weren't normal. She had a different vision from most of us."

Madame Walska's fantasy world begins right at the door of the estate's 8,000-square-foot pink stucco main house. (Afraid of earthquakes, Madame never slept there, living instead in an adjacent pavilion and using the house to store her vast collections of clothes, flying-saucer hats and Tibetan art.) Guarding the doorway are succulent trees, *Euphorbia ingens*, from southeast Africa. Their trunks rise 30 feet high and then tumble eerily back to earth in menacing tentacles that writhe along the ground, causing nervous visitors to instinctively sidestep them lest an ankle be snatched in an octopus-like embrace. Cacti in all sizes, shapes and varieties bristle along the gravel driveway. And there are enough golden barrel cacti, known as "mother-in-law seats" for their uninviting footstool-like shapes, to discommode every meddlesome mama in Southern California.

Madame Walska never bothered to learn the Latin names for her exotic specimens. She referred to the New World desert plants flanking one side of the driveway as "the cactus" and the African euphorbias on the other side as "the *other* cactus." "She wasn't a plant person in that sense," Hayes says. "She wasn't interested in names, only how things looked." Until the Lotusland Foundation began preparing the grounds for public visits, many of the specimens were unmarked, and even today staff botanists keep finding species that they have never catalogued.

What looked good to her didn't always square with the opinions of others, either. Plants are often clustered and jammed together to the point of overgrowth. Massing dozens or even hundreds of plants was her idea of beauty. "Where one tree would suffice, she'd put in 30,"

says William Paylen, the garden designer who created Lotusland's fern garden.

On one occasion she agreed to host the prestigious Palm Society, then panicked because she feared Lotusland didn't have enough varieties to satisfy the society's "palm nuts." She quickly had more palms trucked in, many quite sizable, and planted at the last minute. How many more? "Closer to a hundred or more," Hayes says, with the resigned air of someone who could not possibly explain all Madame's whims.

The major concepts were all Madame Walska's ideas, and she gained a reputation for collecting unusual items to include in her displays. In the fescue-carpeted blue garden, where greens mingle with aquamarines and azures, irregular chunks of blue glass border the walks and twinkle back the sunlight. They were rescued from a scrap heap at a Southern California bottling plant. Abalone shells gathered from Santa Barbara fisheries surround the pool in the aloe garden, where she had giant clamshells from the Tasman Sea converted to fountains. Bronze cranes wade in the pool in the Japanese garden. And she was whimsical. At one point she collected carousel animals and dotted the grounds with them. For another project she imported some 30 topiary animals in pots to dance around a giant clock set in the ground with a face of low-growing succulents. (The animals are gone now but the clock still ticks, and the Lotusland Foundation hopes to restore the display.) The monster yellow, pink and white lotuses that gave the place its name fill what was the original swimming pool; Madame Walska converted it to a water garden after building another swimming pool elsewhere.

Madame Walska apparently never envisioned such a vast enterprise, according to her niece, Hania Tallmadge, who grew up in a cottage on the property. "I think she took it project by project," Tallmadge says. "She thought it would be nice to add a Japanese garden, and she focused on nothing but the Japanese garden until it was complete. All her life she was passionately involved in whatever she was doing, and she was passionately involved with each stage of the garden."

That was certainly the history of the cycad garden,

The aloe garden (above) boasts more than 130 species. Millions were spent to create a world-class collection of cycads (center). The water garden (right), originally the swimming pool, is still flanked by a bathhouse.

which Peter Raven, director of the Missouri Botanical Garden in St. Louis and one of botany's leading authorities, calls "the jewel of Lotusland." Cycads are prehistoric plants—fossilized forms have been found in rock strata 250 million years old—that grow in the wild on all continents except Europe and Antarctica. Examples such as the sago palm occasionally turn up in home gardens. The primitive cycads precede flowers in botanical development, reproducing via cones. Madame Walska was a long time recognizing the cycads' appeal. But, Hayes says, "once she was made to understand how rare and wonderful they are," she set out to collect as many as she could, and nothing would stop her until she had a world-class cycad garden. Among public gardens, her collection is second only to that of the Orto Botanico in Naples, Italy, for the number of taxa represented by its specimens. Lotusland's garden contains more than 400 plants, including representatives of 10 of the 11 known cycad genera and more than half of the known species.

The showpiece specimens are treated reverentially. You approach with awe the hillock where three *Encephalartos woodii* stand frond by spiky frond overlooking a pond, an artificial waterfall and a strategically placed bench where visitors can pay homage to these fan-shaped, head-high plants that have escaped extinction. All *E. woodii* in the world today derive from a single male clump found in South Africa, part of which was transplanted to Durban Botanic Gardens in 1903. Because no female plant has ever been found, Lotusland's examples have been cloned from shoots from the original.

To help pay for her multimillion-dollar garden and lifestyle, Madame Walska went to Parke-Bernet Galleries and auctioned some of her diamonds, emeralds and rubies, including two glittering tiaras and one of her trademark heart-shaped diamond rings, which went for a cool $105,000 in 1971.

Like some of her plants, Madame—she never answered to any other name—could be quite prickly. "She was hot tempered and could be very unjust," says Bill Paylen. She hired a noted landscape architecture firm to design the Japanese garden, but when the plans were presented, she couldn't understand them. She threw

Walska brought whimsical carved stone figures from her French estate to Lotusland. Spiny cacti stand guard around her pink stucco house.

them down and angrily stalked off. Frank Fujii, later a staff gardener, and Oswald da Ros, a stonemason, took over. "She always had her say," Fujii says diplomatically. "We had to make a few compromises." Although she was known to be generous, lavishing employees with Christmas bonuses, and gifts when their children were born, some of the staff trembled at her approach.

She was the head gardener, she insisted, and made the rounds of her beloved plants twice a day, even in her 90s, when crippling arthritis forced her to lean on two canes. "As long as she could walk, she went out in the garden. She wore me out," laughs Hania Tallmadge. "I could hardly get back to my car after the morning visit, and I'd say to myself, 'She does this twice a day?'"

"My aunt was famous for many things," Tallmadge continues. "Famous for her jewelry. Famous for her costumes. Famous for her great beauty. Famous for her husbands. And now famous for her garden."

"She gave us a wonderland," Virginia Hayes says. "Marvelous plants, plants you will see nowhere else. But I think the main attraction in this garden is still Ganna Walska. It's one woman's creation, an interesting woman, a many-sided woman. Even for those of us here, she remains mysterious, an unknown quantity."

A traveling exhibition on women photographers doesn't skirt the issue

Pub Outing (opposite), taken by Scottish-born Grace Robertson in 1954, and *American Girl in Italy* (above), a 1951 shot by Ruth Orkin, are among the exhibition's 246 photographs.

Dorothea Lange, Imogen Cunningham, Margaret Bourke-White . . . most of us have heard of these photographers and have some familiarity with their work. But how about Grace Robertson, Ruth Orkin or Lily White? These names are probably unfamiliar, but they won't be for long. Between a book published in 1994—*A History of Women Photographers*, by art historian Naomi Rosenblum—and an exhibition of the same name that is now touring the country, photographs by all these women, and more than 200 others, have been brought together and placed in historical context. Co-curated by Rosenblum and Barbara Tannenbaum, chief curator of the Akron Art Museum in Ohio, the show began its tour last fall at the New York Public Library. It is now at the National Museum of Women in the Arts in Washington, D.C. (until May 4), and will later go to the Santa Barbara Museum of Art in California (June 7 to August 17) and the Akron Art Museum (September 6 to November 2), which organized it.

The steady stream of visitors who went through the show when it was in New York, as well as its long list of supporters, headed by the John S. and James L. Knight Foundation, testify to the fact that our interest in photography, including its history, is stronger than ever. In the past year or two alone, scholars and curators of all stripes have raised the visibility of the works of Dorothea Lange, Dixie Vereen, Graciela Iturbide, Consuelo Kanaga and the inimitable Julia Margaret Cameron—the list goes on (see the SMITHSONIAN magazine Website, www.smithsonianmag.si.edu, for other current exhibitions)—and that's just the tip of the iceberg. In the sifting process, the great images will endure; but they

must be seen to be judged. "People have asked me, why a show on women photographers?" says Rosenblum. "It's not that I want to separate out women and say they're better or worse. It's because the history was getting lost, that's why." Rosenblum realized this when she was researching her earlier book, *A World History of Photography*, which was first published in 1984 and is now a standard reference work. She kept running across fine women photographers who, although often well known in their own time, seemed to be slipping into oblivion. The situation has changed since the mid-1970s, says Rosenblum; there has been a huge increase in the numbers and prominence of women working in the field. The need now, she says, "is to recover, and present to a wide public, the work of those who preceded them."

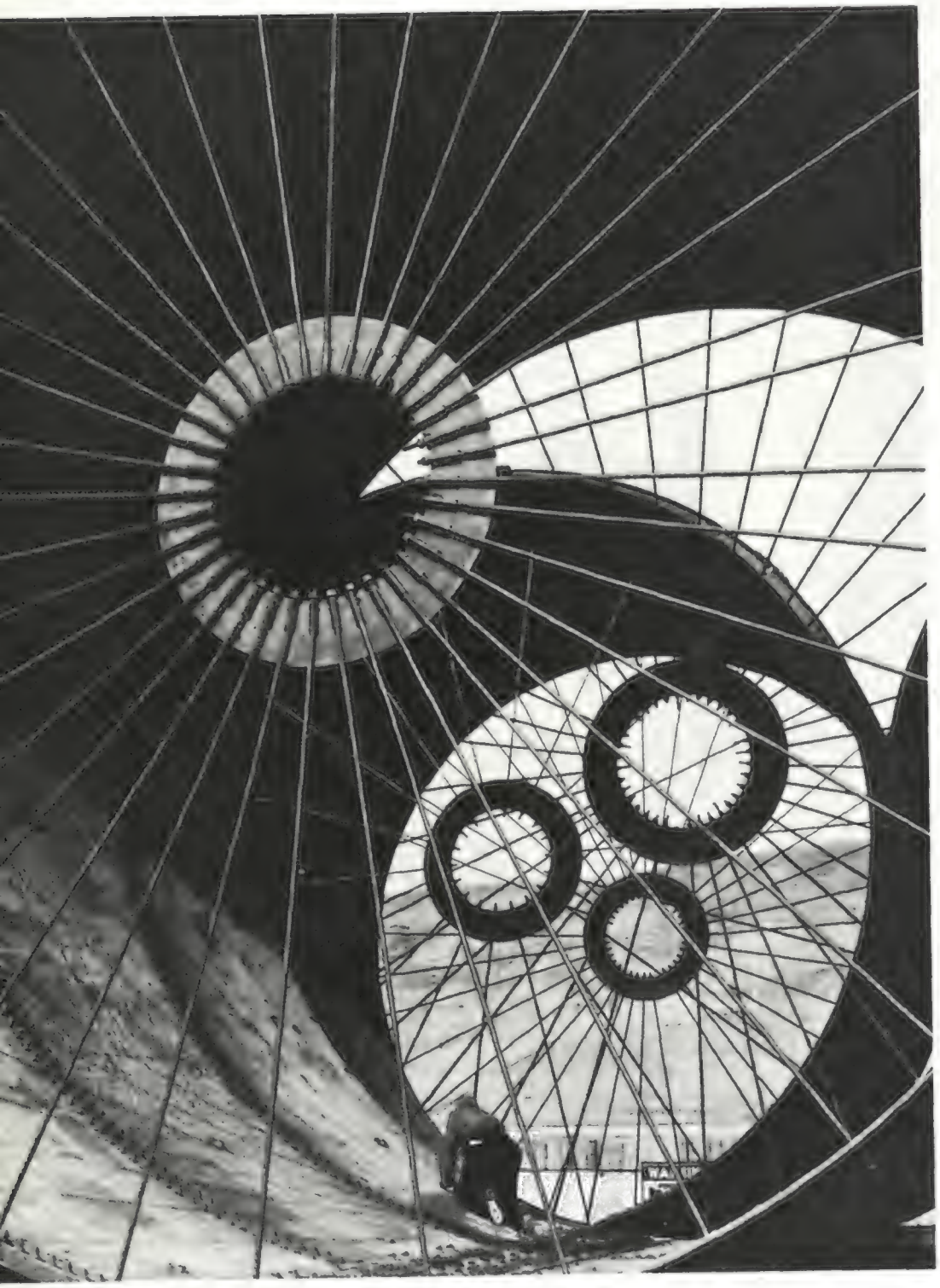
Lily White is the most recent case in point. When Rosenblum visited the Portland Art Museum in Oregon last year, curator Terry Toedtemeier showed her Lily White's platinum prints. White, who lived from about 1868 to 1931, had a houseboat, the *Raysark,* that she kept on the Columbia River. Her father had built it complete with a darkroom and running water. White is represented in the show by a print entitled *Evening on the Columbia,* circa 1902-04 (pp. 116-17); the partially concealed structure near the shore may be the *Raysark.*

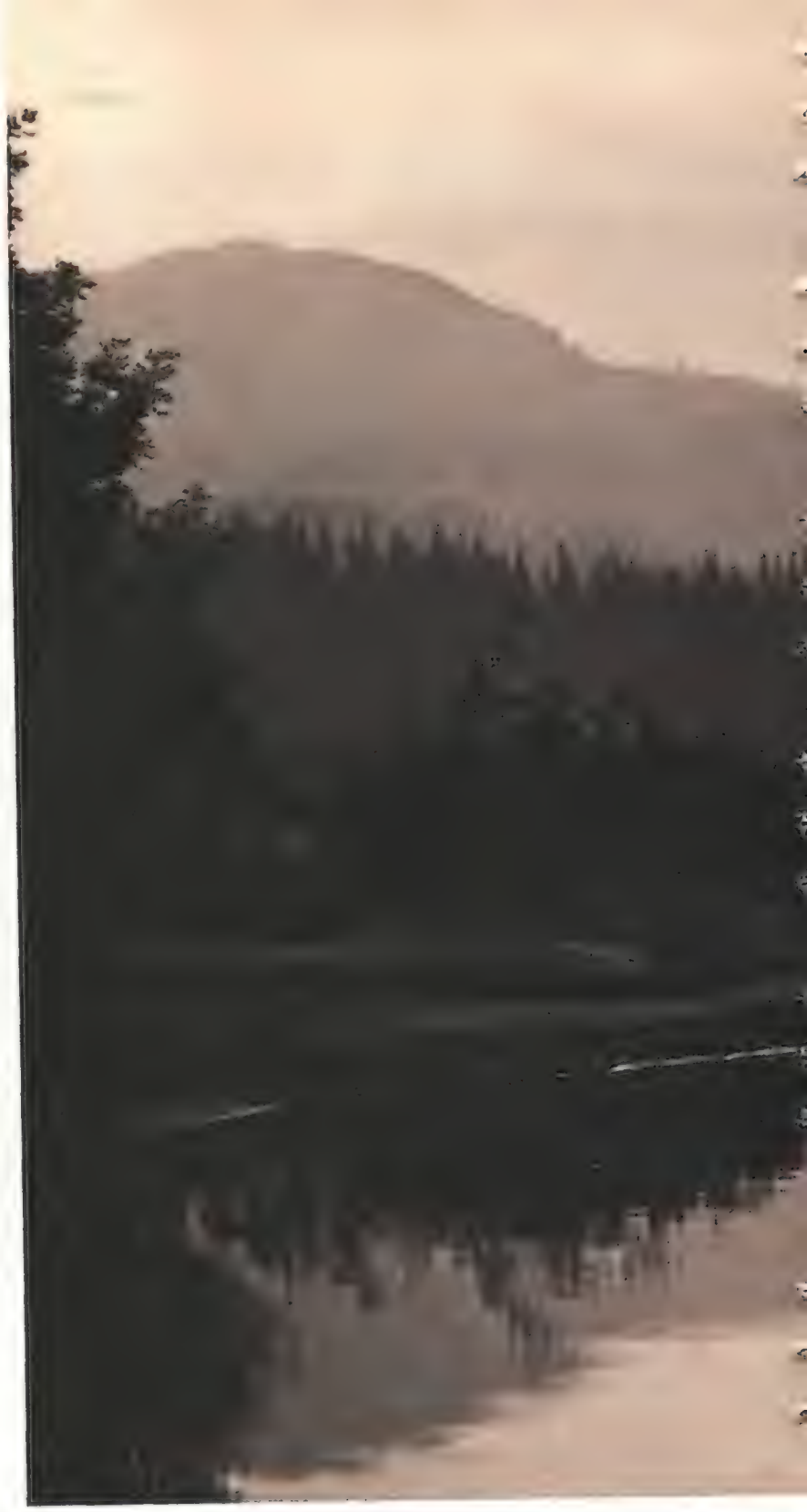
White didn't make it into the book; it had just been published. But that's all right with Rosenblum and Tannenbaum. They don't regard the book or the show as definitive. The way they see it, filling in the gaps in our photographic history is an ongoing process—and one that promises to continue.

Constance Bond

Above: Else Simon produced *Hands Study*, from about 1920, at Atelier Yva, her Berlin advertising studio. Forced by the Nazis to give up her studio because she was Jewish, she died in a concentration camp. Left: Margrethe Mather's portrait of friend William Justema in a kimono, circa 1923, is both poetic and decorative. During the previous decade, Mather had worked closely with Edward Weston. Opposite: *False Hellebore* by Imogen Cunningham dates from 1926. Also in Weston's circle, Cunningham was a founding member of the f/64 group.

Below: Margaret Bourke-White's *Wind Tunnel Construction, Ft. Peck Dam, Montana*, dates from 1936. A photographer for *Life* magazine for 30 years, and for the U.S. Army Air Corps, she is particularly well known for her coverage of Europe during World War II. Below, right: Barbara Morgan's double image of dancer Valerie Bettis evolved from her work in the 1930s, when she began to photograph members of the Martha Graham Dance Company, as well as Merce Cunningham, José Limon and other legends of dance.





Above: *Evening on the Columbia* (c. 1902-04); the Columbia River gorge, with its changing moods, was the subject of a series of platinum prints by Lily White, who could be the figure in the boat. Left: Liliane De Cock's *Storm near Santa Fe, New Mexico,* from 1965, is typical of her black-and-white, large-format landscapes. She has been working in still-life photography with found objects.

The images shown here are (clockwise, from upper left) *Marie Baratte,* 1972-73, by Wendy Snyder MacNeil; Dorothea Lange's *Migratory Cotton Picker, Eloy, Arizona,* 1940; *Suzanne in the Tuileries,* 1974, by British fashion photographer Sarah Moon; and the startling *Cat and I,* 1932, a montage by Italian portraitist Wanda Wulz.

By Jonathan Broder

A family, a colony, a life of good works in the Holy City

Founded more than a century ago, the American Colony in Jerusalem has endured hardships, wars, upheaval, and the ebb and flow of empires

It was December 9, 1917, the height of the First World War, and in Palestine, four centuries of Ottoman rule were hurtling to an end. While the British general Sir Edmund Allenby massed men and artillery in the Judaean hills for the conquest of Jerusalem, an American woman named Anna Spafford secured the Holy City with a bedsheet.

The 75-year-old Anna presided over the American Colony, a community of expatriates who lived on a sprawling estate outside the Old City walls. Shortly after dawn on that clear winter day, Jerusalem's Ottoman mayor arrived at the Colony's villa with the news that he was going to surrender the city. The Turkish Army had fled, he explained, and he wanted to reach the British encampment in time to avert Allenby's onslaught.

As the mayor and his aides turned to leave, Anna noticed that they dutifully carried Jerusalem's ancient iron keys, but no white flag. Without the ensign, she knew, they would be cut down by snipers at the front, and the British would launch their attack after all. So Anna quickly tore off a large square from a bedsheet, attached it to a stick and advised the mayor to hold it high,

Members of the American Colony assemble, c. 1908, outside their Ottoman villa. Founder Anna Spafford is seated, second from left, in the second row; daughter Bertha Spafford Vester holds a baby, far right; blonde grandchild Anna Grace sits on a blanket, front right.

Under protection of a white flag torn from a Colony bedsheet, Jerusalem's Ottoman mayor (with cane) surrenders to British sergeants, December 9, 1917.

for his own sake and that of Jerusalem.

Her prudence paid off. Waving Anna's bedsheet as he made his way out of the city, the mayor and his retinue formally surrendered to two British sergeants (above). Two days later, after an official surrender had been made to one of his generals, Allenby strode triumphantly through the Jaffa Gate. In a letter home later that week, Col. T. E. Lawrence ("of Arabia")—who had accompanied Allenby into Jerusalem—marveled that never before had the city "fallen so tamely."

Anna's makeshift flag is on display at London's Imperial War Museum, a reminder of that historic event. But for the American Colony, the story of the flag represents just one chapter in the remarkable saga of an expatriate family who devoted their lives to the peace and people of the Holy City.

It has been just over a century since Anna Spafford founded what became the American Colony, a kind of expatriate Hull House to help Jerusalem's sick, wounded and needy. Since then, with faith, courage and the force of their personalities, three generations of Spafford women have maintained the Colony and its humanitarian tradition through wars, political upheaval and the ebb and flow of empires.

Their mission of mercy was handed down from mother to daughter to granddaughter. Anna Spafford, and later, her daughter Bertha Spafford Vester, established medical clinics, orphanages, social welfare programs, soup kitchens and schools, administering what was, in essence, America's first foreign aid program in the Holy Land. For a time, their colony flourished as one of Palestine's first successful communes, predating the first Jewish kibbutz by more than 25 years. Eventually, to help fund the Colony's charitable works, Bertha's daughter, Anna Grace Lind, transformed their villa into the American Colony Hotel, creating one of the most fabled landmarks in the modern Middle East.

Secluded behind a garden wall in the eastern, Arab sector of the city, the American Colony Hotel still evokes the exotic backdrop against which the Spaffords played out their lives. The elegant 19th-century structure, with its large, airy rooms, vaulted ceilings and arched windows, once served as the residence of a wealthy Ottoman pasha. The walls of the entry hall are inlaid with intricate tile mosaics, and the upstairs parlor, or "Pasha's Room," has a blue-painted wooden ceiling with a gilded Damascene dome (p. 133). The rooms surround a flower-filled courtyard with a fountain, tables shaded by an old cypress tree, and bougainvillea bristling purple against the Colony's ocher stone walls.

"The hotel has the feel of not being in this century at all," says Sir Peter Ustinov, the actor and a longtime Spafford family friend. "It's more like some old colonial outpost, where you can sit languorously in the shade, sipping a gin and tonic, and occasionally whacking at a wasp with your newspaper."

Two stately palms once towered over the Colony's courtyard, presented as gifts in 1904 by Ustinov's grandfather, Baron Plato von Ustinov, another expatriate in Palestine at the turn of the century. During British Mandate days, personalities such as Allenby, Lawrence, the Arabist Gertrude Bell and Colonial Minister Winston Churchill sought respite in the courtyard's cool

A former foreign correspondent, Jonathan Broder is editor of NPR's Weekend All Things Considered.

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BRIEF SUMMARY

Indications and Usage:

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Contraindications:

Hypersensitivity to etodolac. Patients in whom etodolac, aspirin, or other NSAIDs induce asthma, urticaria, or other allergic-type reactions. Severe, rarely fatal anaphylactic-like reactions have been reported in such patients receiving NSAIDs.

Warnings:

RISK OF GI ULCERATION, BLEEDING, AND PERFORATION WITH NSAID THERAPY - Serious GI toxicity, such as bleeding, ulceration, and perforation, can occur at any time, with or without warning symptoms, in patients treated chronically with NSAIDs. Remain alert for ulceration and bleeding in such patients even in the absence of previous GI-tract symptoms. In clinical trials, symptomatic upper GI ulcers, gross bleeding, or perforation appear to occur in approximately 1% of patients treated for 3-6 months and in about 2-4% of patients treated for 1 year. Inform patients about the signs and/or symptoms of serious GI toxicity and what steps to take if they occur. Studies have failed to identify any subset of patients not at risk of developing peptic ulceration and bleeding. Except for a history of serious GI events and other risk factors associated with peptic ulcer disease, such as alcoholism, smoking, etc., no risk factors (e.g., age, sex) have been associated with increased risk. Elderly or debilitated patients seem to tolerate ulceration or bleeding less well than others and most spontaneous reports of fatal GI events are in this population. Studies to date are inconclusive concerning the relative risk of various NSAIDs in causing such reactions. High doses of any NSAID probably carry a greater risk of these reactions, although controlled clinical trials showing this do not exist in most cases. In considering the use of relatively large doses (within the recommended dosage range), sufficient benefit should be anticipated to offset the potential increased risk of GI toxicity.

ANAPHYLACTOID REACTIONS: Anaphylactoid reactions may occur in patients without prior exposure to etodolac. Lodine XL should not be given to patients with the aspirin triad. The triad typically occurs in asthmatic patients who experience rhinitis with or without nasal polyps, or who exhibit severe, potentially fatal bronchospasm after taking aspirin or other NSAIDs. Fatal reactions have been reported in such patients. Seek emergency help in cases where an anaphylactoid reaction occurs.

ADVANCED RENAL DISEASE: In cases with advanced kidney disease, initiate treatment with close monitoring of kidney function.

PREGNANCY: Avoid Lodine XL or other NSAID therapy during late pregnancy (risk of premature closure of ductus arteriosus).

Precautions:

General:

Renal Effects: Patients with impaired renal function, heart failure, liver dysfunction, those taking diuretics, and the elderly are at greater risk of overt renal decompensation. Discontinuation of therapy typically results in recovery to the pretreatment state.

Hepatic Effects: With NSAIDs, borderline elevations of liver tests may occur in up to 15% of patients. They may disappear, remain unchanged, or progress with continued therapy. In clinical trials, elevations of ALT or AST (approximately three or more times the upper limit of normal) have been reported in approximately 1% of patients. A patient with symptoms and/or signs suggesting liver dysfunction, or in whom an abnormal liver test has occurred, should be evaluated for the development of a more severe hepatic reaction. Rare cases of liver necrosis and hepatic failure, some with fatal outcomes, have been reported. If clinical signs and symptoms consistent with liver disease develop, or if systemic manifestations occur (e.g., eosinophilia, rash, etc.), discontinue therapy.

Hematological Effects: Anemia may occur; it may be due to fluid retention, GI blood loss, or an incompletely described effect upon erythropoiesis. Patients should have their hemoglobin or hematocrit checked if they develop signs or symptoms of anemia. Lodine XL may interfere to some extent with platelet function and vascular responses to bleeding.

Fluid Retention and Edema: Fluid retention and edema have been observed in some patients; therefore, use with caution in those with fluid retention, hypertension, or heart failure.

Pre-existing Asthma: Do not administer to patients with aspirin-sensitive asthmas, and use with caution in all patients with pre-existing asthma.

Information for Patients: NSAIDs, like Lodine XL, can cause discomfort and, rarely, more serious side effects, such as GI bleeding that may result in hospitalization and even fatal outcomes. Patients should report to their physicians signs or symptoms of GI ulceration or bleeding, blurred vision or other eye symptoms, skin rash, weight gain, or edema. Follow chronically treated patients for the signs and symptoms of ulcerations and bleeding and inform them of the importance of follow-up. Instruct patients to seek medical emergency help in case of an occurrence of anaphylactoid reactions.

Laboratory Tests: Patients on long-term therapy should have their hemoglobin or hematocrit checked periodically for signs/symptoms of anemia. If clinical signs and symptoms consistent with liver disease develop, or if systemic manifestations occur (e.g., eosinophilia, rash, etc.) and if abnormal liver tests are detected, persist, or worsen, discontinue therapy.

Drug Interactions: Use caution when giving concomitantly with antacids, aspirin, warfarin, cyclosporine, digoxin, or lithium. Coadministration of Lodine and phenylbutazone is not recommended.

Drug/Laboratory Test Interactions: False-positive for urinary bilirubin and/or urinary ketone. Small decreases in serum uric acid levels have been observed.

Carcinogenesis, Mutagenesis, and Impairment of Fertility: No carcinogenic effect was demonstrated in mice or rats receiving 15 mg/kg/day orally or less for 2 years or 18 months, respectively. Etodolac was not mutagenic in certain *in vitro* animal studies. However, data from the *in vitro* human peripheral lymphocyte test showed an increase in the number of gaps among etodolac-treated cultures compared to negative controls. Oral etodolac doses of up to 16 mg/kg showed no impairment of fertility in rats. However, reduced implantation of fertilized eggs occurred in the 8 mg/kg group.

Pregnancy: Teratogenic Effects - Pregnancy Category C: Use during pregnancy only if the potential benefits justify the potential risk to the fetus. Avoid use during late pregnancy.

Labor and Delivery: Effects of Lodine XL on labor and delivery in pregnant women are unknown.

Nursing Mothers: It is not known whether etodolac is excreted in human milk. A decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother.

Pediatric Use: Safety and effectiveness have not been established.

Geriatric Population: In patients ≥65 years of age, no substantial differences in the side effect profile of Lodine XL were seen compared with the general population; nevertheless, caution should be exercised.

Adverse Reactions:

In clinical trials, most adverse events were mild and transient. In controlled trials, the discontinuation rate due to adverse events was as high as 10% in etodolac-treated patients.

Incidence greater than or equal to 1% — probably causally related:

Body as a whole: chills, fever.

Digestive system: dyspepsia (10%), abdominal pain*, diarrhea*, flatulence*, nausea*, constipation, gastritis, melena, vomiting.

Nervous system: asthenia/malaise*, dizziness*, depression, nervousness.

Skin and appendages: pruritus, rash.

Special senses: blurred vision, tinnitus.

Urogenital system: dysuria, urinary frequency.

*Drug-related patient complaints occurring in 3-9% of patients. Drug-related patient complaints occurring in fewer than 3%, but more than 1%, are unmarked.

Incidence less than 1% — probably causally related: (Reactions not seen in clinical trials are considered rarer and are italicized).

Body as a whole: *allergic reaction, anaphylactoid reaction.*

Cardiovascular system: hypertension, congestive heart failure, flushing, palpitations, syncope, *vasculitis (including necrotizing and allergic).*

Digestive system: thirst, dry mouth, ulcerative stomatitis, anorexia, eructation, elevated liver enzymes, *cholestatic hepatitis,* hepatitis, *cholestatic jaundice, duodenitis, jaundice, hepatic failure, liver necrosis,* peptic ulcer with or without bleeding and/or perforation, *intestinal ulceration, pancreatitis.*

Hemic and lymphatic system: ecchymosis, anemia, thrombocytopenia, bleeding time increased, *agranulocytosis, hemolytic anemia, leukopenia, neutropenia, pancytopenia.*

Metabolic and nutritional: edema, serum creatinine increase, *hyperglycemia in previously controlled diabetic patients.*

Nervous system: insomnia, somnolence.

Respiratory system: asthma.

Skin and appendages: angioedema, sweating, urticaria, vesiculobullous rash, *cutaneous vasculitis with purpura, Stevens-Johnson Syndrome,* hyperpigmentation, *erythema multiforme.*

Special senses: photophobia, transient visual disturbances.

Urogenital system: *elevated BUN, renal failure, renal insufficiency, renal papillary necrosis.*

Incidence less than 1% — causal relationship unknown:

Body as a whole: infection, headache.

Cardiovascular system: arrhythmias, myocardial infarction, cerebrovascular accident.

Digestive system: esophagitis with or without stricture or cardiospasm, colitis.

Metabolic and nutritional: change in weight.

Nervous system: paresthesia, confusion.

Respiratory system: bronchitis, dyspnea, pharyngitis, rhinitis, sinusitis.

Skin and appendages: alopecia, maculopapular rash, photosensitivity, skin peeling.

Special Senses: conjunctivitis, deafness, taste perversion.

Urogenital system: cystitis, hematuria, leukorrhea, renal calculus, interstitial nephritis, uterine bleeding irregularities.

Overdosage:

May develop lethargy, drowsiness, nausea, vomiting, epigastric pains, GI bleeding, coma, or anaphylactoid reaction. Hypertension, acute renal failure, and respiratory depression are rare. Empty stomach and use usual supportive measures.

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shadows. During the 1948 Arab-Israeli War, a mortar bomb destroyed one of the Ustinov palms; the other tree, peppered with shrapnel in the 1967 fighting, died a few years ago.

The hotel has hosted not only generals and statesmen, but also artists, scholars, writers and celebrities. While filming *Lawrence of Arabia*, actor Peter O'Toole dropped in to hear the Spaffords' personal recollections of the legendary British soldier. Over the years, foreign correspondents have made themselves at home at the American Colony, finding its East Jerusalem location a convenient spot from which to report on both sides of the Israeli-Palestinian conflict.

Remarkably, despite the tensions between Jerusalem's Jewish and Palestinian communities, the Spaffords have managed to keep their hotel above the political fray. It is no accident that the secret negotiations between Israel and the Palestine Liberation Organization that culminated in their historic 1993 peace accord began with a meeting at the American Colony.

Since the peace accord, the Colony has become a center of Middle East intrigue, as Israelis and Palestinians address their most difficult issues, in-

Family matriarch Anna Spafford sought a life of service in Jerusalem.

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Anna's daughter Bertha Vester served as a Red Cross nurse in World War I.

cluding the future of Jerusalem itself. Just like at Rick's Café Americain, the expatriate watering hole of *Casablanca*, it seems everyone with a stake in the Middle East peace process now stays at the Colony or drops by the bar for a drink. Amid the haze of cigarette smoke and the tinkle of a piano, the talk is of international politics, business deals, the constant threat of Arab-Israeli violence.

In addition to the hotel, the American Colony runs the 70-year-old Spafford Children's Center, a pediatric clinic just inside the Old City walls. Each year, some 20,000 poor Palestinian mothers come with their children to the hilltop clinic for free medical care, prenatal and nutritional advice, and special education. Its staff includes both Palestinian and Israeli doctors in another effort by the Spaffords to foster goodwill in the disputed city.

Shortly before she died three years ago, I visited with Anna Grace Lind at the Children's Center, where she served, like her mother before her, as its director. We walked through the whitewashed, high-domed wards, past the nurses' station to the small apartment where she lived.

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On the walls of her living room, framed citations and medals from the Ottoman, British, Jordanian and Israeli governments testified not only to the family's good works but also to its stamina. The crenellated parapet of the Old City wall, built in the 16th century by Suleyman the Magnificent, formed one side of the small courtyard where we sat.

"Of course I knew Lawrence," Anna Grace said, pouring us both some cold lemonade. "When I was a girl, I used to play football with him when he visited the Colony. I remember he was rather mysterious." A petite woman in her 80s, with white hair and lively blue eyes, she spoke with a clipped English accent, the product of a colonial education in Mandate Palestine. Her education had also included outings with the sons of senior British officials and dances with the Prince of Wales, later Edward VIII but at the time a young British officer in Jerusalem. "He was very charming. We would laugh quite a bit together," she said, smiling. "Of course, that was before he married that silly Simpson woman."

Anna Grace pulled out several old family albums and leafed through one until she came upon a photograph of her mother, Bertha Spafford Vester. The photograph showed a tall, strikingly beautiful woman with dark hair and finely chiseled features. It was her mother, Anna Grace explained, who had initially befriended Lawrence, then an adventurous but little-known colonel, impressing him at a Jerusalem dinner party with her fluent Arabic. Once, Anna Grace mused, Bertha corrected his grammar, causing the two to quarrel. At about the same time, Lawrence met another Spafford family friend, the American journalist Lowell Thomas, who popularized Lawrence's wartime exploits and immortalized him as the legendary "Lawrence of Arabia."

As she turned the pages of the albums, Anna Grace guided me through a century of life at the American Colony. In one sepia-toned photograph, American pioneers in high-buttoned clothes reaped grain in a Jerusalem field. In another, taken at a July Fourth celebration after the British conquest of Jerusalem, a group of Colony children waving banners and dressed in stars and stripes posed with Anna Spafford and General Allenby (p. 128). There were hundreds of such images, juxtaposing the many worlds they straddled—images of wounded Turkish soldiers being treated in the clinic; of British officers attending parties in the Colony's courtyard; images of war, of smashed buildings, and of Arab and Jewish refugees fleeing their neighborhoods.

Then Anna Grace turned to a photograph of her grandmother, the family matriarch and the founder of the American Colony. Anna Spafford's

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portrait showed a face straight out of a Grant Wood painting, with a firm mouth and pale eyes. She had begun her charitable work in Chicago after the great fire of 1871. The 29-year-old Anna and her husband, Horatio, a successful lawyer and Presbyterian deacon, opened the doors of their lakefront household to scores of displaced citizens. Then, two years later, while sailing to Europe for a well-earned rest, Anna barely survived a shipwreck in which her four young daughters drowned. In 1880, tragedy struck again when a young son died of scarlet fever.

Naturally, Anna Grace explained, her grandparents had turned to their church. Yet instead of finding solace, they found themselves ostracized, victims of the prevailing church doctrine that judged their anguish as divine retribution for their "sins." Determined to lead a simple religious life of humanitarian service, the Spaffords left Chicago in 1881 and set sail for the Holy Land with two young daughters, both born after the family's tragic loss at sea, and an entourage of friends and family. Arriving after a monthlong voyage, they settled into the house that the clinic now occupies, a large stone manor perched on a hilltop, high above the squalor of Jerusalem's ancient, unwashed alleyways.

This was American frontiersmanship at its most extreme. In the 19th century, Jerusalem was a forgotten outpost of the Ottoman Empire. There were few hospitals or schools, no telephones, sewers or electricity. At dusk, Turkish guards closed the heavy wooden gates of the city wall to keep out marauding bands of bedouin. Soon after the Spaffords' arrival, a skeptical American diplomat warned Washington that the colonists' efforts would "result in disappointment and disaster."

Within a few years, Horatio was dead from malaria. But amazingly, Anna prevailed. Against all expectations, she and her small extended clan struck roots in Jerusalem, working as nurses and educators. A charismatic woman, Anna eventually attracted a group of Midwesterners to the American Colony. A century ago last year, needing more space, Anna and her followers moved into the pasha's palatial villa. Within months, a group of Swedes joined the Colony, bringing the number of members to 130.

Anna directed the Colony's charitable services from the building in the Old City, while the other members la-

During a Fourth of July celebration in 1918, Anna Spafford (far left) escorts Gen. Edmund Allenby (to left of children) as he reviews costumed colonists.

bored to make the Colony self-sufficient in their new home outside the city walls. Organizing themselves into a commune, they raised their own crops and livestock, wove their own cloth and made their own clothes. Soon, in addition to their reputation as healers and educators, the colonists became known as the artisans of Jerusalem, operating a carpentry business, a bakery, a forge, a photography service and a store that sold souvenirs to tourists. For their amusement, the colonists organized their own literary society, an art club, a band and a choir. To earn additional money, the Colony began calling itself the American Colony Hostel, opening its doors to American and European pilgrims seeking a clean, comfortable place to stay in the Holy City.

With the outbreak of World War I in 1914, the Colony's pastoral existence ended, and its tradition of wartime relief began. Fighting between the British and the Turks in the eastern

Anna Grace Lind succeeded mother Bertha as head of the Colony clinic.

Mediterranean severed supplies of food and fuel to Palestine, a situation that deteriorated into full-blown famine after a plague of locusts in 1915. While many American and British diplomats and missionaries pulled out of Palestine, the American colonists remained. With the food from their farm, they opened a soup kitchen, sometimes feeding more than a thousand people a day. At night, they worked by the dim glow of lamps improvised from discarded sardine tins filled with sesame oil.

But in the spring of 1917, a German officer attached to the Turkish Army dismissed the Colony's relief work as "American propaganda" and shut it down completely. The Colony found itself helpless in the face of the closure. "Thousands must have died from slow starvation and disease," Bertha wrote in her memoirs. "Many women brought their babies to us and offered to sell them for a pittance, just to be sure of a few more meals."

In the face of so much suffering, the Spaffords decided to offer the Colony's services to the Turkish governor of the region, Jamal Pasha. One of the "Young Turks" who had overthrown the Ottoman sultan before the war, Jamal Pasha was ruthless and unpredictable, and Bertha's Arab friends

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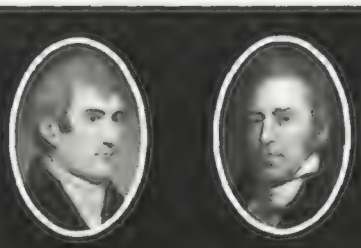

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Children play in the orphanage founded by Bertha Vester in 1925 in the Old City manor that was the Spafford family's first residence in Jerusalem.

warned her to stay away from him. Not surprisingly, Bertha ignored them. When the Turkish governor received her at his Jerusalem residence on April 6, 1917, Bertha found him "cold and distant" but soon learned the reason why. The United States had just declared war on Germany, Turkey's ally in the war. When Jamal Pasha asked if she was still willing to nurse his wounded, Bertha did not flinch. "We are not offering our services to Turkey or Germany or any other country," she declared. "We are offering our services to humanity." Taken aback by this bold American, he accepted her offer.

Eventually, the colonists took over four Ottoman hospitals and a government soup kitchen in Jerusalem, keeping thousands of people alive. The wartime conditions under which they worked were not only harsh but intimidating. Every day, it seemed, Jerusalem residents suspected as pro-British were hanged, their bodies left dangling from the ramparts of the Jaffa and Damascus gates as a warning to others. On that December day in 1917 when the mayor surrendered, the Colony was directing all of the city's relief operations. Anna Grace was 12 at the time. "I stood with my mother and grandmother and watched as a British officer returned with the mayor, who was still waving my grandmother's flag," she recalled. "We all wept with joy."

A few weeks later, Anna Spafford hosted four generals and 20 other British officers for a post-Christmas dinner. The Colony's band performed, and the choir sang Handel's "Hallelujah Chorus" to celebrate Jerusalem's deliverance. At midnight, a fierce artillery barrage shattered the revelry; the retreating Turks had regrouped and launched a counterattack. As British guns repulsed the attack, Anna Grace lay awake in bed, fascinated by the flashes that lit up the sky and rumbled over the Judaean hills.

Anna Grace remembered her mother as a complex, indomitable woman, equally at home in the Western and Middle Eastern cultures that defined the family's life. Self-confident and patrician, Bertha mixed effortlessly with men like Lawrence, Allenby and Churchill. To underscore her American pedigree, she kept a framed certificate of her membership in the Daughters of the American Revolution.

At the same time, having grown up

in Jerusalem since the age of 3, Bertha instinctively understood the older, more deeply textured culture of the Middle East. As a child, she had spent summers in the desert as the guest of a bedouin chieftain who had befriended her parents. Bertha maintained the friendship, and Anna Grace recalled the thunderous, unexpected arrivals of the tribesmen on horseback; the commotion as they pitched their goatskin tents in the Colony's garden; and the scimitars and antique rifles respectfully left by the entrance. Most of all, Anna Grace remembered her mother, sitting cross-legged inside the tent after dinner, holding the bedouin spellbound with stories of the Battle of Gettysburg, and of the wolves that roamed the American prairies when Bertha's mother, Anna, was a girl.

After Anna died in 1923, Bertha took over the Colony's leadership and expanded its charitable work. One of her most beloved accomplishments resulted from an incident that occurred on Christmas Eve in 1925. As Bertha prepared to join her family in Bethlehem to sing carols, she encountered a poor bedouin leading his ailing wife and their infant child on a donkey, in search of medical treatment. Bertha admitted the wife into one of the Colony's hospitals, where she died the next morning. At the bedouin's insistence, Bertha took in the child. Soon more children followed, and a wing of the Old City building became the Anna Spafford Baby Home.

But Bertha had another side as well—appearing to some as imperious, vain or snobbish. While most of the other expatriate children completed their studies at the American Colony school, Bertha sent her sons and daughters on to tony private schools in Jerusalem and the United States. She hosted parties for the British colonial elite and illustrious visitors like Lady Astor and John D. Rockefeller, but often excluded other members of the Colony. This elitist behavior nearly destroyed the American Colony. In 1929, believing that Bertha had become too powerful, some of the members pulled out, nearly breaking up the commune. But once again, the Spaffords remained in Jerusalem, continuing their lives at the villa and their many charitable works.

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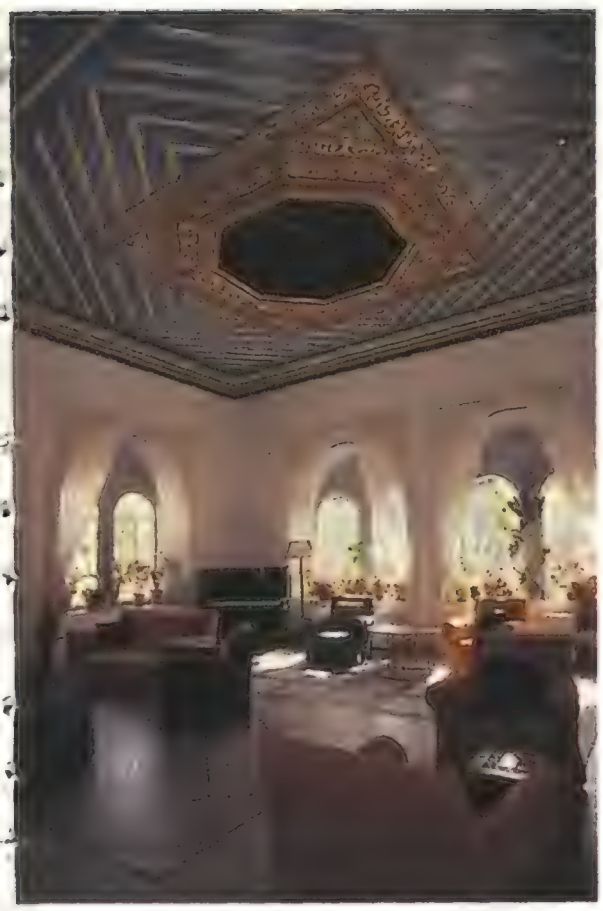
the British Eighth Army, which was fighting the Germans in North Africa. Bertha entertained her friends and turned the Colony's villa into a Red Cross station, preparing medical supplies for the frontline troops. Though Arab-Jewish hostilities had escalated during the British Mandate period, during the war, "Jewish and Arab ladies sat at the same table, making surgical dressings . . . and talking," Bertha later wrote. "For the time being controversy was buried."

But as soon as the war ended, communal violence between Arabs and Jews flared anew, along with terrorist attacks by both sides against the British. Anna Grace, who was living in the United States at the time, returned to a Jerusalem of checkpoints, barbed wire and barricades. One day, outside Herod's Gate, she was overseeing a group of workers as they loaded the clinic's broken playground equipment onto a truck for repair. Suddenly gunfire erupted, and a British soldier who had been standing guard fell dead at Anna Grace's feet. "The driver and all the workers ran away, leaving me with a truck full of broken swings and seesaws," she recalled. "I had never driven a truck before, but I learned very quickly that day."

In July 1946, in response to Britain's repeated refusal to grant entry permits to Jewish refugees, a group of Jewish terrorists bombed British military headquarters at the King David Hotel. In 1948, when Israel declared its independence and the first Arab-Israeli war erupted, the Colony found itself only yards away from the battlefront that divided the western, Jewish side of the city from its eastern, Arab sector. To ensure the Colony's neutrality, Bertha again placed the villa under the Red Cross flag. Even so, the property took at least 30 direct hits, shattering windows and destroying one of Baron von Ustinov's palms.

For all her arrogance, Bertha was nothing if not brave. At one point, she even managed to arrange her own cease-fire during the height of the struggle for Jerusalem. An elderly Colony member had died, but the Colony's cemetery on the slopes of Mount Scopus was enveloped in fight-

Industrious colonists at the turn of the century gather in the upstairs parlor, or "Pasha's Room," of their thriving commune to spin, sew and socialize.

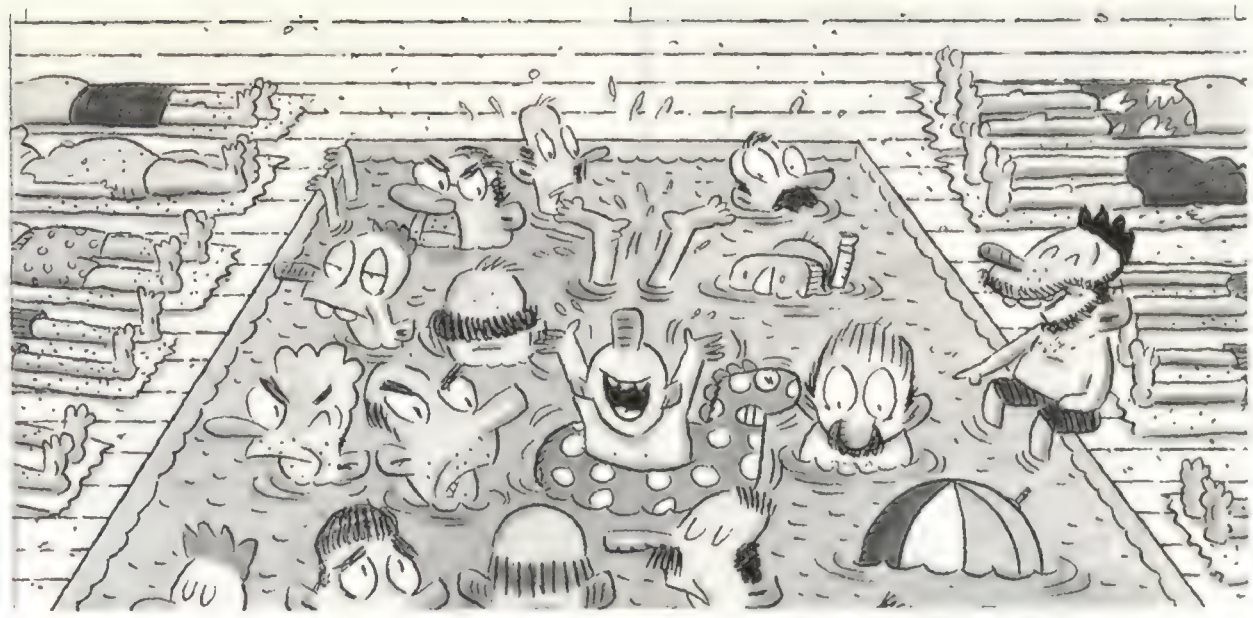


A more contemporary view shows off the room's elaborate gilded ceiling.

ing. Bertha called on the senior commanders on the Israeli and Arab sides and secured their agreement to a truce so she could bury the man. But afraid of snipers, no one would agree to ferry the coffin to the cemetery. With the truce ticking away, Bertha convinced the driver of a grocery van to carry the coffin up the hill. A brief funeral service was held, after which the mourners quickly returned to the Colony. Within minutes, the fighting resumed.

On another occasion, just prior to the war, a group of Arab soldiers took up positions on the Colony's grounds in order to fire on a Jewish convoy. Storming outside to confront the invaders, Bertha told them that they could shoot her if they wished, but she would not allow any attack to be made from the Colony. "To fire from the shelter of the American Colony is the same as firing from a mosque or church," she proclaimed.

The 1949 armistice left Jerusalem a divided city, with the American Colony in the eastern sector, then officially part of Jordan. Pressing ahead with the Colony's charitable mission, Bertha, by then in her 70s, returned to the United



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States to raise funds for the expansion of the Old City clinic into a full-fledged pediatric hospital. Armed with introductions from friends like Lowell Thomas, Bertha met with potential donors around the country. At one such gathering in New York, she found herself in the presence of a particularly attractive young woman. When Bertha naively asked her name, the woman introduced herself as Marilyn Monroe, and promptly burst into giggles.

Returning to Jerusalem with donations and grants, Bertha began construction in 1954 of the Spafford Children's Hospital, beside the original clinic in the Old City. In recognition of her work, a young King Hussein awarded Bertha the Jordan Star, making her the first woman to be awarded the prestigious medal.

To help keep the hospital going, the Spaffords decided to turn the American Colony villa into a fully functioning, modern hotel. Starting in 1952, Anna Grace began overseeing the transformation, installing a swimming pool and modern utilities, but carefully preserving the building's 19th-century character. By the early 1960s, the renamed American Colony Hotel had become known as the finest hotel in East Jerusalem.

But it wasn't long before the Spaffords found themselves once again on the front lines of the Arab-Israeli conflict. On June 5, 1967, Anna Grace and her sister Frieda were working at the hospital when they heard sirens wailing on the Israeli side of town. Alerted by a British diplomat that war had erupted, they quickly moved their patients away from the windows. Leaving Anna Grace to look after the hospital, Frieda dashed back to the hotel, only to find a Jordanian tank in the driveway and Arab legionnaires hastily erecting gun positions across the street. Just before noon, the Jordanians opened fire, prompting a retaliatory Israeli barrage. Despite the fighting that raged in and around the Colony compound, the 89-year-old Bertha, nearly deaf and hobbled with a broken hip, refused to budge.

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Current director of Spafford clinic, Dr. Jantien Dajani, examines patient.

By dawn, the fighting had moved farther east, and Frieda emerged to inspect the damage. A neighbor's house was in flames, and a dead Jordanian soldier lay in the driveway. Inside the hotel, Frieda could trace the course of combat from floor to floor. Upstairs, the antique Damascene ceiling had somehow escaped unscathed, but the courtyard lay in shambles. Flowerpots had been shattered, the fountain had been smashed, and the remaining Ustinov palm had been shredded.

Bertha appeared from a back room, unhurt but disoriented. "Who is on the desk this morning?" she asked. Peering into the smashed reception hall, Frieda replied, "The desk isn't there."

The Colony soon repaired its damages and settled in under Israeli rule. In 1968, at the age of 90, Bertha died. Anna Grace, also a trained nurse, took over the hospital and the hotel, with the help of her brother, Horatio, and his wife, Valentine, the niece of Gertrude Bell. The next two decades were the hotel's heyday, as its reputation spread to the United States and Europe, attracting a steady stream of celebrities. Artist Marc Chagall visited

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while he was working on his stained glass windows for the Hadassah Medical Centre. Larry Collins and Dominique Lapierre spent months there researching their book *O Jerusalem!* Graham Greene, Saul Bellow, Alec Guinness and Joan Baez were all guests. And Bob Dylan was rumored to have sequestered himself at the hotel for a time in the early 1970s.

More importantly, after 1967, the imposing stone portals of the American Colony became the gateway through which many Israelis came to know Palestinians personally. Every Saturday, the hotel hosted a sumptuous brunch in the courtyard. Enchanted by the Colony's discreet and gracious ambience, Israelis and Palestinians mingled, often dispelling their mutual fears. While some disapproved of these contacts, over the years the Colony became one of Jerusalem's most important neutral corners.

The Colony's role as a facilitator of Israeli-Palestinian contacts bore diplomatic fruit one afternoon in May 1992. Meeting in a room just off the courtyard, an Israeli official and a senior political operative of the Palestine Liberation Organization agreed to establish a secret negotiating channel in Oslo. Sixteen months later, that diplomatic track led to a ceremony on the White House lawn with the signing of a peace accord and a cathartic handshake between the late Yitzhak Rabin and PLO Chairman Yasir Arafat. Anna Grace watched the ceremony on television. "I felt vindicated," she said.

As Jerusalem marks the close of its 3,000th-anniversary celebrations, the hotel has reached another historic crossroads. Will it end up in an East Jerusalem that becomes the capital of an independent Palestinian state? Or will it remain in a Jerusalem that stays under Israeli rule? If the past is any guide, the American Colony seems destined to live through more political turbulence before these fundamental questions can be answered.

For the Spaffords, however, that prospect is no reason to question the continuity of the American Colony. One evening in March of last year, as part of the Colony's centennial celebrations, some 300 guests joined the Spafford descendants at the hotel to pay tribute to the extraordinary institution they created. There were Israelis, Palestinians, European and American diplomats, United Nations officials, rabbis, Muslim sheikhs, and members of the clergy—a throng speaking at least a dozen different languages, representing a microcosm of Jerusalem's timeless human mosaic. And as they gathered in the storied courtyard, with candlelight dancing off the Ottoman-era stones, Sir Peter Ustinov planted a palm tree to replace the pair given by his grandfather at the beginning of the century. The American Colony, he said, had survived as long as it had because it offered "an ecumenical oasis of peace where people can hold all kinds of discussions. . . . It is an object lesson to the people and the city around it."

Courtyard of the American Colony Hotel evokes ease and elegance of a past era. The hostelry has long served as a neutral corner and an oasis of peace.

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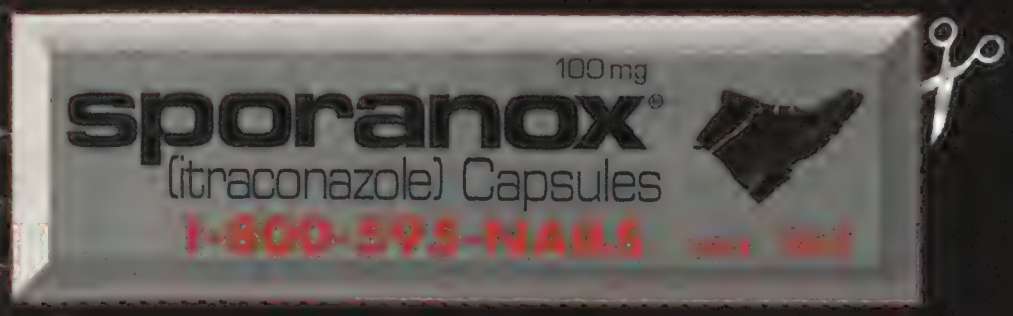

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100 mg

sporanox®

(itraconazole capsules)

Before prescribing, please consult complete prescribing information of which the following is a brief summary.

WARNING: Coadministration of terfenadine with itraconazole is contraindicated. Serious cardiovascular adverse events, including death, ventricular tachycardia, and torsades de pointes have occurred in patients taking itraconazole concomitantly with terfenadine. This is due to elevated terfenadine concentrations caused by itraconazole. See CONTRAINDICATIONS, WARNINGS, and PRECAUTIONS sections.

Another oral azole antifungal, ketoconazole, inhibits the metabolism of astemizole, resulting in elevated plasma concentrations of astemizole and its active metabolite desmethylastemizole, which may prolong QT intervals. Based on results of an *in vitro* study and the chemical resemblance of itraconazole and ketoconazole, coadministration of astemizole and itraconazole is contraindicated. See CONTRAINDICATIONS, WARNINGS, and PRECAUTIONS sections.

Coadministration of cisapride with itraconazole is contraindicated. Serious cardiovascular adverse events including death, ventricular tachycardia, and torsades de pointes have occurred in patients taking itraconazole concomitantly with cisapride. See CONTRAINDICATIONS, WARNINGS, and PRECAUTIONS sections.

INDICATIONS AND USAGE

SPORANOX (itraconazole capsules) is indicated for the treatment of the following fungal infections in immunocompromised and non-immunocompromised patients:

1. Blastomycosis, pulmonary and extrapulmonary;
2. Histoplasmosis, including chronic cavitary pulmonary disease and disseminated, non-meningeal histoplasmosis;
3. Aspergillosis, pulmonary and extrapulmonary, in patients who are intolerant of or who are refractory to amphotericin B therapy; and
4. Onychomycosis due to dermatophytes (tinea unguium) of the toenail with or without fingernail involvement.

CONTRAINDICATIONS

Coadministration of terfenadine, astemizole or cisapride with SPORANOX (itraconazole capsules) is contraindicated. (See BOX WARNING, WARNINGS, and PRECAUTIONS sections.)

Concomitant administration of SPORANOX with oral triazolam or with oral midazolam is contraindicated. (See PRECAUTIONS section.)

SPORANOX should not be administered for the treatment of onychomycosis to pregnant patients or to women contemplating pregnancy.

SPORANOX is contraindicated in patients who have shown hypersensitivity to the drug or its excipients. There is no information regarding cross hypersensitivity between itraconazole and other azole antifungal agents. Caution should be used in prescribing SPORANOX to patients with hypersensitivity to other azoles.

WARNINGS

In U.S. clinical trials prior to marketing, there have been three cases of reversible idiosyncratic hepatitis reported among more than 2500 patients taking SPORANOX (itraconazole capsules). One patient outside the U.S. developed fulminant hepatitis and died during SPORANOX administration. Since this patient was on multiple medications, the causal association with SPORANOX is uncertain. If clinical signs and symptoms consistent with liver disease develop that may be attributable to itraconazole, SPORANOX should be discontinued.

Prior to U.S. marketing, there have been three cases of life-threatening cardiac dysrhythmias and one death reported in patients receiving terfenadine and itraconazole. (See BOX WARNING, CONTRAINDICATIONS, and PRECAUTIONS sections.)

Coadministration of astemizole with SPORANOX is contraindicated. (See BOX WARNING, CONTRAINDICATIONS, and PRECAUTIONS sections.)

Concomitant administration of oral ketoconazole with cisapride has resulted in markedly elevated cisapride plasma concentrations, prolonged QT intervals, and has rarely been associated with ventricular arrhythmias and torsades de pointes. Due to potent *in vitro* inhibition of the hepatic enzyme system mainly responsible for the metabolism of cisapride (cytochrome P450 3A4), itraconazole is also expected to markedly raise cisapride plasma concentrations; therefore, concomitant use of cisapride with SPORANOX is contraindicated. (See BOX WARNING, CONTRAINDICATIONS, and PRECAUTIONS sections.)

PRECAUTIONS

General: Hepatic enzyme test values should be monitored in patients with preexisting hepatic function abnormalities. Hepatic enzyme test values should be monitored periodically in all patients receiving continuous treatment for more than one month or at any time a patient develops signs or symptoms suggestive of liver dysfunction.

SPORANOX (itraconazole capsules) should be administered after a full meal.

Under fasted conditions, itraconazole absorption was decreased in the presence of decreased gastric acidity. The absorption of itraconazole may be decreased with the concomitant administration of antacids or gastric acid secretion suppressors. Studies conducted under fasted conditions demonstrated that administration with 8 ounces of a cola beverage resulted in increased absorption of itraconazole in AIDS patients with relative or absolute achlorhydria. This increase relative to the effects of a full meal is unknown.

Information for patients: Patients should be instructed to take SPORANOX with a full meal.

Patients should be instructed to report any signs and symptoms that may suggest liver dysfunction so that the appropriate laboratory testing can be done. Such signs and symptoms may include unusual fatigue, anorexia, nausea and/or vomiting, jaundice, dark urine or pale stool.

Drug interactions: Both itraconazole and its major metabolite, hydroxyitraconazole, are inhibitors of the cytochrome P450 3A4 enzyme system. Coadministration of SPORANOX and drugs primarily metabolized by the cytochrome P450 3A4 enzyme system may result in increased plasma concentrations of the drugs that could increase or prolong both therapeutic and adverse effects. Therefore, unless otherwise specified, appropriate dosage adjustments may be necessary.

Coadministration of terfenadine with SPORANOX has led to elevated plasma concentrations of terfenadine, resulting in rare instances of life-threatening cardiac dysrhythmias and one death. (See BOX WARNING, CONTRAINDICATIONS, and WARNINGS sections.)

Another oral azole antifungal, ketoconazole, inhibits the metabolism of astemizole, resulting in elevated plasma concentrations of astemizole and its active metabolite desmethylastemizole which may prolong QT intervals. *In vitro* data suggest that itraconazole, when compared to ketoconazole, has a less pronounced effect on the biotransformation system responsible for the metabolism of astemizole. Based on the chemical resemblance of itraconazole and ketoconazole, coadministration of astemizole with itraconazole is contraindicated. (See BOX WARNING, CONTRAINDICATIONS, and WARNINGS sections.)

Human pharmacokinetics data indicate that oral ketoconazole potently inhibits the metabolism of cisapride resulting in an eight-fold increase in the mean AUC of cisapride. Data suggest that coadministration of oral ketoconazole and cisapride can result in prolongation of the QT interval on the ECG. *In vitro data suggest that itraconazole also markedly inhibits the biotransformation system mainly responsible for the metabolism of* cisapride; therefore concomitant administration of SPORANOX with cisapride is contraindicated. (See BOX WARNING, CONTRAINDICATIONS, and WARNINGS sections.)

Coadministration of SPORANOX with oral midazolam or triazolam has resulted in elevated plasma concentrations of the latter two drugs. This may potentiate and prolong hypnotic and sedative effects. These agents should not be used in patients treated with SPORANOX. If midazolam is administered parenterally, special precaution is required since the sedative effect may be prolonged. (See CONTRAINDICATIONS section.)

Coadministration of SPORANOX and cyclosporine, tacrolimus or digoxin has led to increased plasma concentrations of the latter three drugs. Cyclosporine, tacrolimus and digoxin concentrations should be monitored at the initiation of SPORANOX therapy and frequently thereafter, and the dose of these three drug products adjusted appropriately.

There have been rare reports of rhabdomyolysis involving renal transplant patients receiving the combination of SPORANOX, cyclosporine, and the HMG-CoA reductase inhibitors lovastatin or simvastatin. Rhabdomyolysis has been observed in patients receiving HMG-CoA reductase inhibitors administered alone (at recommended dosages) or concomitantly with immunosuppressive drugs including cyclosporine.

When SPORANOX was coadministered with phenytoin, rifampin, or H_2 antagonists, reduced plasma concentrations of itraconazole were reported. The physician is advised to monitor the plasma concentrations of itraconazole when any of these drugs is taken concurrently, and to increase the dose of SPORANOX if necessary. Although no studies have been conducted, concomitant administration of SPORANOX and phenytoin may alter the metabolism of phenytoin; therefore, plasma concentrations of phenytoin should also be monitored when it is given concurrently with SPORANOX.

It has been reported that SPORANOX enhances the anticoagulant effect of coumarin-like drugs. Therefore, prothrombin time should be carefully monitored in patients receiving SPORANOX and coumarin-like drugs simultaneously.

Plasma concentrations of azole antifungal agents are reduced when given concurrently with isoniazid. Itraconazole plasma concentrations should be monitored when SPORANOX and isoniazid are coadministered.

Severe hypoglycemia has been reported in patients concomitantly receiving azole antifungal agents and oral hypoglycemic agents. Blood glucose concentrations should be carefully monitored when SPORANOX and oral hypoglycemic agents are coadministered.

Tinnitus and decreased hearing have been reported in patients concomitantly receiving SPORANOX and quinidine. Edema has been reported in patients concomitantly receiving SPORANOX and dihydropyridine calcium channel blockers. Appropriate dosage adjustments may be necessary.

The results from a study in which eight HIV-infected individuals were treated with zidovudine, 8 ± 0.4 mg/kg/day, showed that the pharmacokinetics of zidovudine were not affected during concomitant administration of SPORANOX, 100 mg b.i.d.

Carcinogenesis, Mutagenesis and Impairment of Fertility: Itraconazole showed no evidence of carcinogenicity potential in mice treated orally for 23 months at dosage levels up to 80 mg/kg/day [approximately 10x the maximum recommended human dose (MRHD)]. Male rats treated with 25 mg/kg/day (3.1x MRHD) had a slightly increased incidence of soft tissue sarcoma. These sarcomas may have been a consequence of hypercholesterolemia, which is a response of rats, but not dogs or humans, to chronic itraconazole administration. Female rats treated with 50 mg/kg/day (6.25x MRHD) had an increased incidence of squamous cell carcinoma of the lung (2/50) as compared to the untreated group. Although the occurrence of squamous cell carcinoma in the lung is extremely uncommon in untreated rats, the increase in this study was not statistically significant.

Itraconazole produced no mutagenic effects when assayed in appropriate bacterial, non-mammalian and mammalian test systems.

Itraconazole did not affect the fertility of male or female rats treated orally with dosage levels of up to 40 mg/kg/day (5x MRHD) even though parental toxicity was present at this dosage level. More severe signs of parental toxicity, including death, were present in the next higher dosage level, 160 mg/kg/day (20x MRHD).

Pregnancy: Teratogenic Effects. Pregnancy Category C: Itraconazole was found to cause a dose-related increase in maternal toxicity, embryotoxicity and teratogenicity in rats at dosage levels of approximately 40-160 mg/kg/day (5-20x MRHD) and in mice at dosage levels of approximately 80 mg/kg/day (10x MRHD). In rats, the teratogenicity consisted of major skeletal defects; in mice it consisted of encephaloceles and/or macroglossia.

There are no studies in pregnant women. SPORANOX should be used for the treatment of systemic fungal infections in pregnancy only if the benefit outweighs the potential risk. SPORANOX should not be administered for the treatment of onychomycosis to pregnant patients or to women contemplating pregnancy. SPORANOX should not be administered to women of child-bearing potential for the treatment of onychomycosis unless they are taking effective measures to prevent pregnancy and the patient begins therapy on the second or third day of the next normal menstrual period. Effective contraception should be continued throughout SPORANOX therapy and for 2 months following treatment.

Nursing Mothers: Itraconazole is excreted in human milk; therefore, SPORANOX should not be administered to nursing women.

Pediatric Use: The efficacy and safety of SPORANOX have not been established in pediatric patients. No pharmacokinetic data are available in children. A small number of patients age 3 to 16 years have been treated with 100 mg/day of itraconazole for systemic fungal infections and no serious unexpected adverse effects have been reported.

In three toxicology studies using rats, itraconazole induced bone defects at dosage levels as low as 20 mg/kg/day (2.5x MRHD). The induced defects included reduced bone plate activity, thinning of the zona compacta of the large bones and increased bone fragility. At a dosage level of 80 mg/kg/day (10x MRHD) over one year or 160 mg/kg/day (20x MRHD) for six months, itraconazole induced small tooth pulp with hypocellular appearance in some rats.

While no such bone toxicity has been reported in adult patients, the long term effect of itraconazole in pediatric patients is unknown.

HIV-infected Patients: Because hypochlorhydria has been reported in HIV-infected individuals, the absorption of itraconazole in these patients may be decreased.

The results from a study in which eight HIV-infected individuals were treated with zidovudine, 8 ± 0.4 mg/kg/day, showed that the pharmacokinetics of zidovudine were not affected during concomitant administration of SPORANOX, 100 mg b.i.d.

ADVERSE REACTIONS

In U.S. clinical trials prior to marketing, there have been three cases of reversible idiosyncratic hepatitis reported among more than 2500 patients. One patient outside the U.S. developed fulminant hepatitis and died during SPORANOX (itraconazole capsules) administration. Because this patient was on multiple medications, the causal association with SPORANOX is uncertain. (See WARNINGS section.)

ONYCHOMYCOSIS:

Adverse events in the following table led to either temporary or permanent discontinuation of treatment:

Body System/Adverse Event	Incidence (%) (n=112)
Elevated Liver Enzymes (>2x normal range)	4%
Gastrointestinal Disorders	4%
Rash	3%
Hypertension	2%
Orthostatic Hypotension	1%
Headache	1%
Malaise	1%
Myalgia	1%
Vasculitis	1%
Vertigo	1%

SYSTEMIC FUNGAL INFECTIONS:

Adverse experience data in the following table are derived from 602 patients treated for systemic fungal disease in U.S. clinical trials, who were immunocompromised or receiving multiple concomitant medications. Of these patients, treatment was discontinued in 10.5% of patients due to adverse events. The median duration before discontinuation of therapy was 81 days, with a range of 2-776 days. The table lists adverse events reported by at least 1% of patients.

Body System/Adverse Event (Incidence ≥ 1%)	Incidence (%)
Gastrointestinal Disorders	
Nausea	10.6
Vomiting	5.1
Diarrhea	3.3
Abdominal Pain	1.5
Anorexia	1.2
Body as a Whole	
Edema	3.5
Fatigue	2.8
Fever	2.5
Malaise	1.2
Skin and Appendages	
Rash	8.6*
Pruritus	2.5
Central and Peripheral Nervous System	
Headache	3.8
Dizziness	1.7
Psychiatric Disorders	
Libido decreased	1.2
Somnolence	1.2
Cardiovascular Disorders	
Hypertension	3.2
Metabolic and Nutritional Disorders	
Hypokalemia	2.0
Urinary System Disorders	
Albuminuria	1.2
Liver and Biliary System Disorders	
Hepatic function abnormal	2.7
Reproductive Disorders, Male	
Impotence	1.2

*Rash tends to occur more frequently in immunocompromised patients receiving immunosuppressive medications.

Adverse events infrequently reported in all studies included: constipation, gastritis, depression, insomnia, tinnitus, menstrual disorder, adrenal insufficiency, gynecomastia and male breast pain.

In worldwide postmarketing experience with SPORANOX, allergic reactions including rash, pruritus, urticaria, angioedema and in rare instances, anaphylaxis and Stevens-Johnson syndrome, have been reported. Marketing experiences have also included reports of elevated liver enzymes and rare hepatitis. Although the causal association with SPORANOX is uncertain, rare hypertriglyceridemia and isolated cases of neuropathy have also been reported.

OVERDOSAGE

Itraconazole is not removed by dialysis. In the event of accidental overdosage, supportive measures, including gastric lavage with sodium bicarbonate, should be employed.

No significant lethality was observed when itraconazole was administered orally to mice and rats at dosage levels of 320 mg/kg or to dogs at 200 mg/kg.

Rev. April 1995, September 1995

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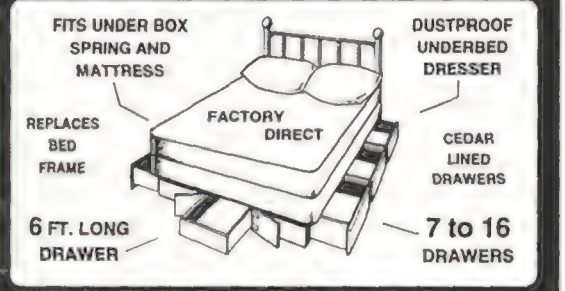

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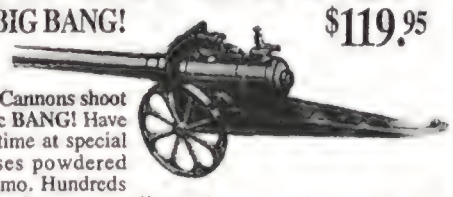

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Book Reviews

Stand Facing the Stove: The Story of the Women Who Gave America The Joy of Cooking
Anne Mendelson
Henry Holt, $29.95

Auguste Escoffier: Memories of My Life
Auguste Escoffier, translated by Laurence Escoffier
Van Nostrand Reinhold, $30

Irma Rombauer was 54 years old when the first edition of *The Joy of Cooking* appeared in 1931. She had decided to put together a recipe collection after the death of her husband in 1930 and paid $3,000 to publish the book. Everyone thought it was a recipe for disaster. "But Irma, who will buy your book?" asked one contributor. "All our friends *have* all those recipes." Her relatives were blunter. "Worst idea I ever heard of," was the word from her brother's family. "Irma's a TERRIBLE cook."

That judgment may sound harsh, but Anne Mendelson's wonderfully entertaining biography makes it clear that it wasn't exactly unwarranted. "Canned soups," says Mendelson, "were one of her true loves," along with bouillon cubes, food coloring and "molded salads of the X-number-of-ingredients-set-in-gelatin ilk." Both Irma and her daughter Marion, Mendelson avers, "adored the can opener as the best friend of any woman with the wit to use one."

To those knowing only the modern (1975) edition of Irma Rombauer and Marion Rombauer Becker's kitchen bible, Mendelson's comments may sound as off-base as the remarks of Irma's brother. But the *Joy of Cooking* that most people use today (an initial "The" was dropped from the book's title in 1962) is six major revisions and scores

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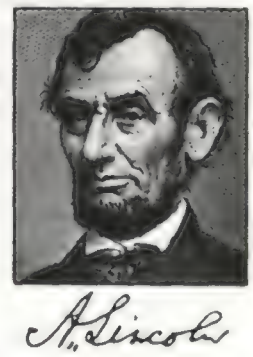

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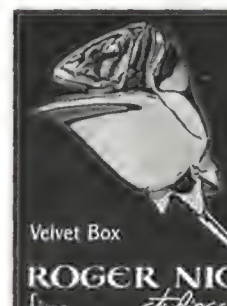

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of printings removed from Irma's original book. Just as *Joy* changed the lives of its authors, and of millions of Americans, it has itself been transformed into something very different from what it was at its birth.

Biography is always a complex task, demanding the excavation and evaluation of contradictory sources, the recreation of bygone times, and a rigorous interpretation of the fluid and ambiguous elements of a person's life. Mendelson's subject is particularly daunting, however, because her story involves four main characters (mother, daughter, book and publisher) whose lives span more than a century of dramatic changes in American social and culinary history.

To understand the relationships among these characters, think soap opera. Irma is the star—a spirited, competitive, charming and manipulative woman whose buoyant attitude hides a series of unhappy secrets. (Her brother Emil was a notorious con man, her husband committed suicide, and her relationships with friends and family members were often rocky.) Marion, in contrast, is steady, serious and a bit dowdy. She "had a vast talent for making friends," many of them artistic and creative, and enjoyed at least one well-managed love affair before her marriage, but to Irma she remained an ugly duckling.

The cookbook plays the role of family patriarch, providing large dollops of cash while demanding only periodic attention, yet offering a focus for a series of rifts and reconciliations. And for a villain—a scheming deceiver, constantly fought but never vanquished—the saga of Irma and Marion has Laurance Chambers, the arrogant editor-in-chief of Bobbs-Merrill, *Joy*'s publisher.

Mendelson dishes up this tale like a skillful hostess: she whets our appetites with an assortment of curious facts and intriguing observations, and then sits us down to a carefully crafted dinner. With more than 400 footnoted pages and a cast worthy of Tolstoy, this is no light meal. So to help us digest it, she pauses between courses—chapters describing the progress of Irma's and Marion's lives, the remaking of their cookbook and the battles with their publisher—to talk about culinary history and the things that made *Joy* so successful.

The cookbook's most important feature, Mendelson concludes, is that every edition conveys "a sense of a real, solid

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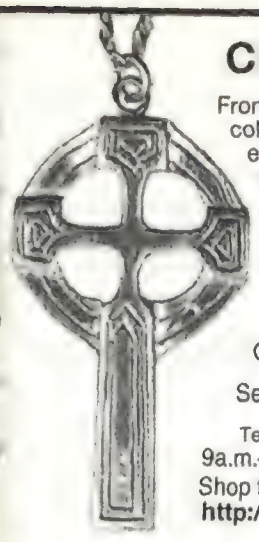

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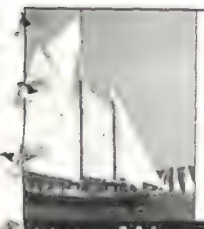

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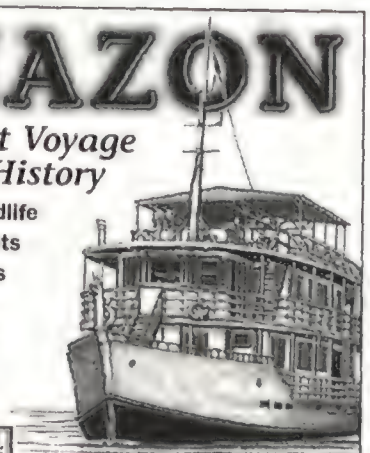

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friendship" between the authors and their audience. "Irma and Marion were both unabashedly amateur cooks—and haste-driven ones at that," but they made their readers comfortable. Filled with advice about everything from cocktails ("serve them by all means, preferably in the living room, and the sooner the better," says my mother's 1946 edition) to leftovers ("Someone defined eternity as a ham and two people," from my 1976 volume), their cookbook made putting meals on the table seem fun.

Auguste Escoffier, often called "the king of chefs and chef of kings," was as elitist about cuisine as Irma and Marion were egalitarian. But the writings collected in *Memories of My Life* make it clear that he also got a great deal of joy—and considerable success—from cooking.

Escoffier was born in 1846 near Nice. The son of a blacksmith, at age 13 "I was informed that I was to be a cook, and I was given no option but to obey." Yet even as an apprentice, Escoffier understood that the presentation of food was as important as its preparation. Menus, he says, should read like "a sort of poem recalling the happy hours spent" over a meal, and in his recipe for Pêche Melba (vanilla ice cream topped with peaches and sugared raspberry puree) he insists that it be served in a silver dish embedded in an ice sculpture—he preferred a swan.

Escoffier's recipes are nothing like the well-ordered lists and procedures found in the latest *Joy*. To prepare a fish mousse, he instructs us to heat shrimp and truffles for the sauce "until the aroma of the truffles is perfect," and his recipe for paprika prawns includes ingredients measured in spoonfuls, large spoonfuls, teaspoons, dessert spoons and "a large glass."

Although this book is not a guide for cooks, it does convey an artful picture of Escoffier and the world he worked in. An "appropriate menu" he prepared for Cora Pearl (a famous courtesan of the day) and her swain, at a private dinner in Paris, captures Escoffier's style perfectly. The infatuated boy may have missed the significance of his Lamb Cora with artichoke hearts (a *coeur d'artichaut*, the book explains, is French slang meaning something like "besotted sap"), but the next course, Pigeonneaux Cocotte (or "courtesan's little pigeons") surely gave him food for thought.
John R. Alden always tries to learn the food words first when he travels.

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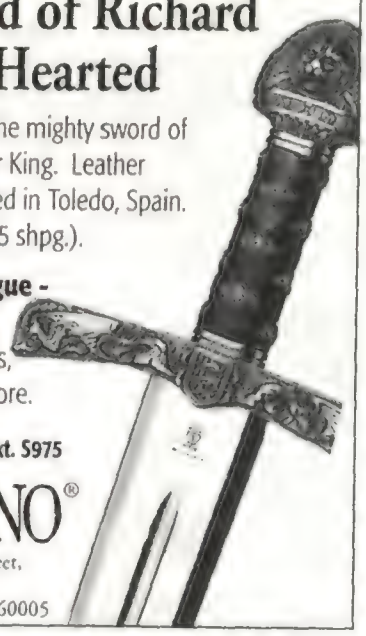

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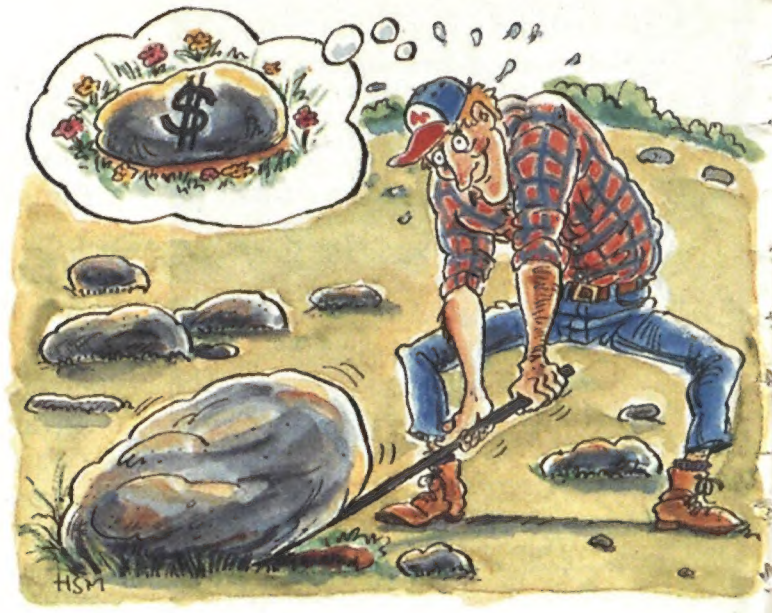
By Chris Granstrom

If rocks were worth money, a hilltop farmer could get rich quick



I can't shake the suspicion that first-time visitors to my farm take a look at my machinery shed and think to themselves that I've gone overboard. How can I justify owning three tractors for the purpose of raising a few acres of strawberries on a Vermont hilltop? Well, the first two tractors have their particular uses, which I won't go into here. The third tractor I own solely because my farm is on a Vermont hilltop. It's my rock-picking machine.

In the fields around here, rocks are like weeds: always plentiful, and with apparent powers of spontaneous regeneration. They're the ever-belligerent enemies of the expensive equipment that I pull behind those first two tractors.

It's a never-ending conflict. On my side, the weapons are a crowbar and a spade. My big artillery is that third tractor. Spring, summer or fall, there's hardly an idle moment that wouldn't be better spent out fighting the rocks. I can just about get a day's work done and lean back in my chair, when the unpleasant thought creeps into my mind that, while I'm taking my leisure, the rocks are calling in reinforcements.

That third tractor is an ancient (1956, to be precise) International Harvester 300 with a bucket loader on the front. It's this loader that makes it my rock machine. I pick an armload of rocks out of the field, carry them over to the bucket and throw them in. When the bucket's full, I drive the tractor to the edge of the woods, push the nose of it as far in among the trees as I can and dump the rocks. I've made some impressive piles this way.

When I find a rock that's too big to extract with hand tools, I come back on the tractor to try to dig it out with the front-end loader. You can't tell how big a submerged rock really is when you start digging, and the old tractor and I have ended up in some mighty battles.

Sometimes, the rock wins. If I can't budge it with my 300, I make a note of it on my mental map of underground dangers. The notes on this mental map accumulate for a year or two—until the next time I happen to have a hired backhoe on the place. When the operator finishes whatever job he came out for, I lead him on a meandering tour of the fields. I point out the trouble spots. It might look like smooth soil from above, but when he puts the teeth of his backhoe in—*clang!* That's the sound of doom for any smug boulder that thought it had defeated me.

Not long ago, the rocks and I were engaged in a temporary standoff, and I was finally able to enjoy a relaxing moment flipping through the pages of a gardening-supply catalog. I was chuckling over the ingenious ways this company had thought up to separate gardeners from their money. Then, on the second to last page, I came across something that stopped me cold. These good folks were selling rocks—12-inch rocks with "irregular shapes" to be used as "garden accents." A gardener who wanted one had to send in $14.95.

You might think that my chuckles would change to guffaws at the notion of people buying rocks. Far from it. I suddenly saw that I'd been going at this whole thing with a wrongheaded attitude. Rocks aren't my enemies; they're my meal ticket.

I did a quick mental inventory of the 12-inch irregularly shaped rocks that I've dumped in piles over the years. I added in the rocks that the farmers who worked this land before me had picked up and piled in stone walls. To that sum, I added the rocks still in the ground—a number that approaches infinity, as any Vermont farmer can tell you. I multiplied the total by $14.95. It seemed that my fortune was at hand.

All I had to do was find buyers. As I worked on my marketing plan, I had to admit that I probably wouldn't sell too many rocks to my neighbors here in Vermont. But there are huge areas in the middle section of this country where there isn't a rock from one horizon to the other.

Then I remembered that the prairies were settled by refugees from New England who fled a thousand miles just to get away from rocks. Yes, some German and Scandinavian immigrants also settled the prairies, but I suspect they were trying to get away from European rocks. The marketing wizards who put out glossy catalogs may think they can sell rocks; I'm beginning to have my doubts. As far as I can tell, the world is made up of two groups: people who already have too many rocks in their ground, and people who moved to get away from rocks. (I'm not counting people who live in cities. They have other things to worry about.)

I'm not ready to give it up. Folks shouldn't be held back by the prejudices of their ancestors. So what if your (and my) great-granddaddy would roll over in his grave to hear of it? A nice rock really can look good in a garden. I'm not just saying this. Long before any catalog guru had come up with the idea, my wife and I had already figured it out. In fact, the prettiest rock I ever hooked a plow point under now holds a place of honor among our lilies.

So if any of you out there wants to buy a rock in your garden, grab a spade and crowbar and come see me. The price? Don't worry, I'll dicker. If you can picture an artistic grouping, I'll offer a quantity discount. It goes without saying that rocks still in the field are much more reasonable than rocks already dug. If you bring your own backhoe, I won't charge a thing.

TWO POLISH BISON ARE WALKING THROUGH THE FOREST

when right beside them they spot a horse-drawn carriage filled with visitors. The group are guests of the recently restored lodge at the edge of the Białowieża Preserve. Where the only remaining herd of European bison has flourished deep inside Europe's last remaining primeval forest. The carriage moves on until the tour guide spots the Białowieża's tarpans – prehistoric miniature horses who once roamed the European plains. The last surviving tarpans have been carefully reintroduced here. Today's herd, the only one in existence, is viewed as a landmark in animal conservation. The Americans on the tour have all arrived here on LOT, the only airline to offer nonstop daily flights between the U.S. and Poland. It's the easiest way for Buffalo to see bison. And vice versa.

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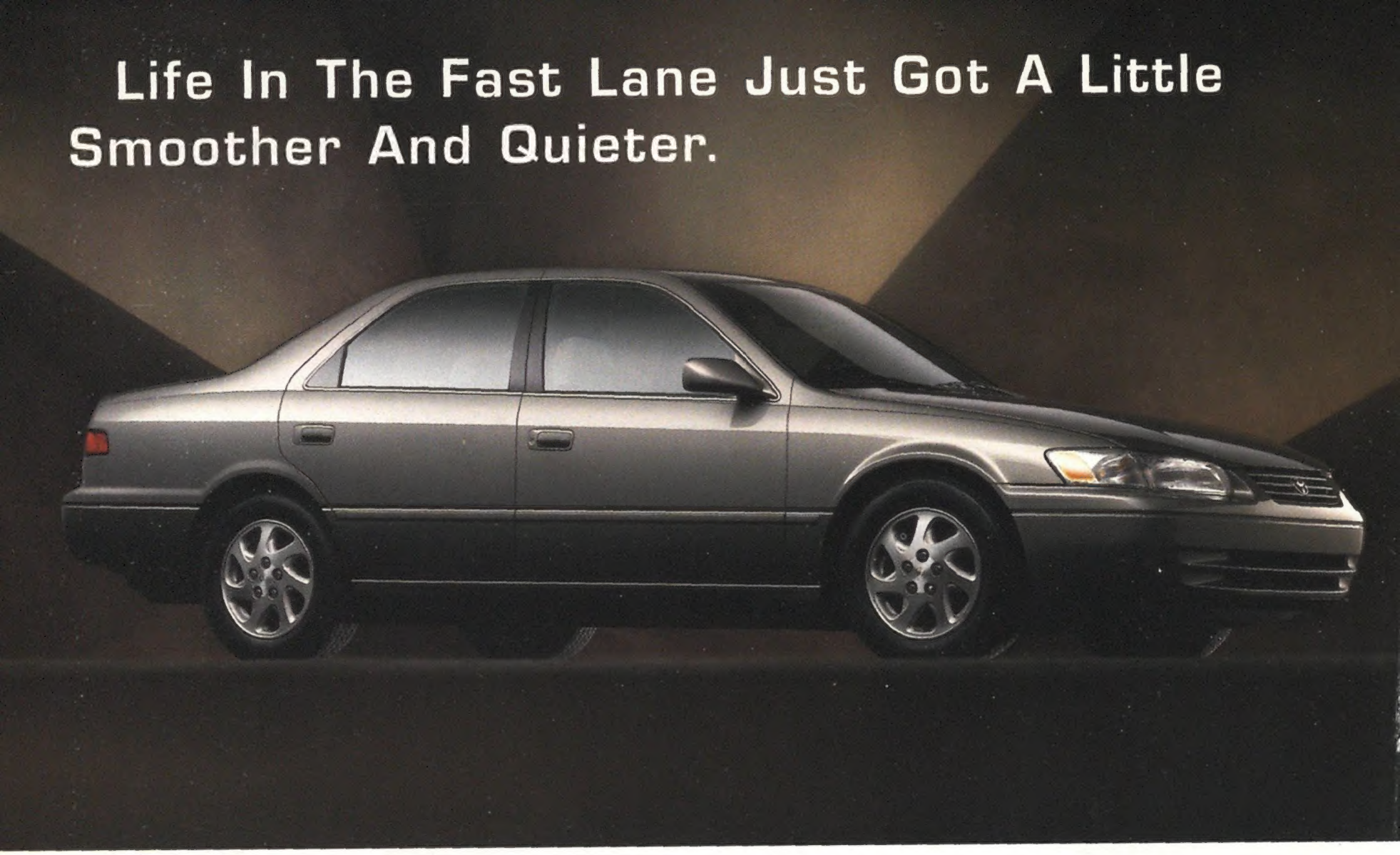

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